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THE INVALID'S MANUAL AND SICK-ROOM GUIDE

Dr STRANGE.

A MANUAL FOR THE INVALID

ETC.

A MANUAL FOR THE INVALID

ETC.

LONDON
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THE

RESTORATION OF HEALTH

OR THE

APPLICATION OF THE LAWS OF HYGIENE

TO THE RECOVERY OF HEALTH:

FORMING

A MANUAL FOR THE INVALID AND A GUIDE

IN THE SICK-ROOM.

BY

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BIBLIOTHECA·BODLEIANA

PREFACE.

THE FAVOUR with which a former little work, 'The Seven Sources of Health,' has been received both by the profession and the public, has induced me to complete my original design, which was that of applying the rules of hygiene to the human frame in its disordered as well as its healthy conditions, and so bringing physiology to bear upon the RESTORATION, as well as upon the PRESERVATION of health.

Restorative medicine is of very recent growth. Until very lately, any proposal to apply the natural agents, or vital stimuli, in the same manner, or with the same objects in view, in the case of disease equally with that of health, would have found but scant favour with the public. Disease was regarded as an entity, an extraneous invader, which must be met by special and exceptional, if not by unnatural means. Every disease was supposed to have its proper, generally its *special* remedy; and the difference between the skill of one physician and of another was

supposed to reside in the greater tact and experience by which he had been able to discover and treasure up the exact remedy for each particular ailment.

After all, the public prejudices are but the cast-off clothes of the scientific few. And the time is within the memory of all but the youngest practitioners, when the enlightenment of the public upon physiological and pathological subjects bearing upon the real nature and causation of disease was looked upon by the majority of professional men as fraught with danger to their patients, and with trouble, annoyance, and damage to the interests of themselves.

Nevertheless, there has been for some time past a growing desire to become acquainted with, at least, the externals of disease, and of physiology as bearing upon it; and with half knowledge has come its inevitable accompaniment, viz., distrust of the means which science uses to combat disease. The status of drugs alone has been still further lowered by the apparent success of hydropathy, homœopathy, and a host of other 'cures;' and this has had the effect in some degree of unsettling the faith of the public in legitimate medicine. In this state of things, many men have been led to the study of the nature of their constitutions, and of the laws of sanitary science, more attentively than formerly; and some, in full

dependence upon the curative powers of nature, have rejected drugs altogether.

Hence the philosophic physician, who observes this sign of the times, is led to ask himself these questions:—1st. *Are* diseases, curable by drugs alone, to the extent that was formerly believed? 2ndly. If not, whither is the diffusion of physiological knowledge, and, indeed, of remedies also, amongst the people, tending? 3rdly. How am I to maintain my post at the helm of the vessel of the CURATIVE ART, and retain the confidence of my patients, not alone in my own skill and honesty, but in the efficacy of the means I am using to subdue the diseases with which they may be attacked?

It were folly to hope to stem the tide of popular knowledge, whether chemical, physiological, or medical. In place of looking upon a little knowledge of such subjects in our patients as a dangerous thing, and one likely to be injurious to them in case of illness, we shall have to take that knowledge, imperfect though it be, into our confidence, treat it with respect, and use our influence to cause its possessors to go on increasing it. We must make allies instead of enemies of our patients; take them into our confidence; treat them as partners in the game, instead of adversaries; and, for that purpose, we must, to such an extent as may be done safely, show them our hand.

Every experienced practitioner must have felt how much more easy and satisfactory it is to treat an educated and judicious, than an ignorant and prejudiced person. We cannot help acknowledging that here, as everywhere, knowledge is a good,—a good *per se*—be its amount and extent small or great. And if I have rightly viewed the tendency of the age, and the temper of educated people, it is proper to place in the hands of such persons works upon which they may rely; to exhibit to them the forces of nature honestly; and, since they will know, to let them know the truth, the whole truth, and nothing but the truth.

When this shall have been done, the public will at length recognise, what every attentive physician knows full well, that there is a great deal to be said for and against the undisturbed influence of the powers of nature in the recovery of health. They will be capable of seeing whither her activities tend, the extent to which they reach, and the degree to which they may be availed of for good, and when their injurious tendencies may be escaped.

In this work, then, from the novelty of the plan, professedly incomplete, after a sketch of the operation of the ordinary vital agents in the production of disease—of the rationale or characteristics of disordered action—and a few observations upon the art of avoiding it, the patient is

taken from the day on which he enters the sick-room until that on which he is completely restored to health; the influence of the natural stimuli of air, temperature, food, drink, exercise, bathing, sleep, climate, soil and situation, change of air and scene, &c., upon the stages of his illness, being severally examined.

I have followed this plan as being a natural, rather than an artistic one; and therefore it is that I venture to express an opinion that the invalid will derive more benefit from a perusal of the work from beginning to end, than from dipping into it and endeavouring to find his own particular disorder portrayed.

It is confessedly difficult to write at once for the profession and for the public. Nevertheless, I have hopes that junior practitioners will find the work useful to them, especially the third part, as forming a manual of practical hygiene, from which some assistance may be rendered to their patients in the management of their convalescence.

Those who wish for a book to teach 'every man to be his own doctor' need not look in these pages. There are no prescriptions, except a few very simple remedies for emergencies, which are placed in the Appendix.

WORCESTER: *June* 22, 1865.

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THE

RESTORATION OF HEALTH.

PART I.

NATURE, CAUSES, AND PREVENTION OF DISEASE.

CHAPTER I.

INTRODUCTORY.

THE NATURE AND CHARACTERISTIC FEATURES OF DISEASE, AND DISORDERED ACTION.

SECTION I.—NATURE OF DISEASE.

Why am I ill?

It will take a good deal of reflection before the reader will be able to give such a reply to this question as shall be satisfactory to himself, at the same time that it does not violate the first principles of inductive reasoning.

In fact, to be able to tell *why* one is ill is not only to have a tolerable acquaintance with the structure and functions of the human body, and with the properties and powers of those natural

agents which are incessantly acting upon it, for good or for evil, but to be able to appreciate the innumerable phases of those powers and the variations in the force with which these two factors react upon each other.

Now, almost every non-medical person is ignorant of these things, notwithstanding the abundance of popular lectures, cheap treatises, handbooks of medicine, and the rest. They have no clear ideas relative to the functions of the body in health or disease, and are even very often profoundly unacquainted with the properties which distinguish the several natural elements by which the animal body is surrounded and affected.

And not only are you ignorant, my *general* reader, of all real causation as applied to health and disease, but your mind is occupied probably with false, partial, or perverted ideas in connection with them. Long ages of pseudo-philosophy have left you an inheritance of words of no, or of doubtful meaning, or suggestive of false analogies and connections, which maintain their hold upon the popular mind by reason either of their specious or fanciful nature, or of the authority derived from ancient usage.

You are the slave, therefore, of your own misconceptions, and of the uncertain experience of others, or else of the dicta of hasty reasoners and empirical dogmatists.

No doubt you can lay your finger upon some part of your body and say that you have pain or

uneasiness there; and you imagine that *that* is the disease. Or you can tell of some common function which is not performed as it ought to be; and *that*, you say, is disease. There is something, you think, in the one case to be removed, cleared away, driven out; in the other, to be rectified, put to rights—tinkered, in fact, like a leaky kettle.

You are wrong in both cases. If you call in your physician to drive something out of you which is giving you pain or annoyance, some *thing* which has entered the body from without or grown up from within, nine times out of ten you will be disappointed. If you ask him to mend a hole in your lungs, cleanse the surface of your stomach, clean out the ducts of your liver, by means of medicine, he can do *none* of these.

But he can enable the system to do it. Instead of sending you a bolus or a draught, to go, as you imagine, *right* to the seat of the disease and drive it out—the very medicine which will just *hit* the complaint, as you term it—the scientific practitioner, any one but the mere routinist, will find out what disorder of the natural functions has taken place, and what hinders their return to the *normal* or healthy state. He will not take your organs to pieces, nor search them through and through with his drugs, as a watchmaker would take to pieces a watch, adjust the disarranged wheel, or mend the broken spring, and then with leather and emery repolish them, and

with his delicate brush cleanse them from all impurities. There may be none of such obstructions in your system to be got rid of, and yet your vital machinery—a thousand times more delicate than that of the finest watch—may be fast coming to a stand-still.

Let us, however, take a better example—an analogy much nearer the mark.

A plant in your greenhouse is sickly—drooping; its leaves curl and turn yellow; its flower-buds drop off; it is altogether sick. From what cause? There has nothing entered the plant to poison it, nor can you give it any physic to purge away any foul humours. Yet, unless it be already in a dying state, you can soon restore it to health and freshness.

There has something gone wrong with regard to the natural agents by which the plant is surrounded—by which it lives. The temperature has been too high, or too low, or too variable, or not variable enough. It has had too much water, or too little, or at improper times; or the soil in which it grows was either never suited to its requirements, or has become exhausted by the action of the roots of the plant; or, lastly, it has been poisoned by the secretions which those roots throw out around them.

Now, you will find out which of these things it is which is killing your flower,—First, by a knowledge of the habits and requirements of the plant; secondly, by an acquaintance with the effect of light, heat, moisture, and the different kinds of soil

upon this individual species, and upon vegetable organisms in general; and thirdly, by careful experimenting. And now, by withdrawing those agents which operate injuriously, and supplying such as are deficient—allowing the plant its natural choice, so to speak—your once drooping flower acquires new freshness and vigour, which soon bring back all its former loveliness.

This is the real analogy. No true comparison can be made between the organised animal body and a piece of dead mechanism, however clever and refined its make. New parts may be put into your watch, or other inanimate machine, and old ones removed, at will. Not so with the living body. There is no cleansing it of the 'perilous stuff' which infests it by means of medicine alone; but we can withdraw those forces which are turning the vital stream into wrong channels, and we can supply those other, without which the living engine is unable, as it were, to keep upon the proper line of rails.

LIFE is the result of the operation of natural agents, such as air, heat, light, food, &c. upon an *already organised and organising structure.* HEALTH is the normal or proper action of the two together; and DISEASE is simply the disordered, or insufficient, action of one of them, or of both reciprocally. Nothing more.

Do you ask *why* there is any disease? Ask why there is any life, or why the phenomena of the universe are not other than they are. A futile question!

Reasoning *à posteriori*, we should expect that an organisation of such wonderful delicacy as that of the human body *would* be readily put out of order; that it would be peculiarly liable to get deranged in the wear and tear of life, in constant contact with the rude elements of nature. All our experience of delicate and complicated machinery is allied to the belief in its fragile nature and extreme susceptibility to injury from rude handling or ignorant use. Just so it is with that most delicate and intricate machine, the human body. At all times it must have been delicately and elaborately fashioned; although, possibly, it may have been originally cast in a somewhat different mould than that which it would now fit. It is especially in modern times, when the arts of civilisation and intellectual cultivation amongst almost all classes have produced a super-delicacy of fibre and exalted susceptibility to external impressions, that the effects of perverted habits of living and ignorance of the laws of health are supremely felt. And it appears to me that it is the general diffusion of this susceptible temperament throughout the mass of the people, unaccompanied with any counter-checks, which renders it so much more difficult to avoid, or to treat, disease than was the case in the primitive ages of man's history.

But we must not, therefore, suppose that this increased susceptibility to outward impressions; this diminished power of resistance, perchance, to

morbific agents of a certain class (not pestilences); this inability to resist the hardships of climate, or to undergo the same amount of muscular exertion as some of our forefathers, bring the physiological condition of the present generation within the category of disease. Man is a cultivatable animal; and the result of taming him, as regards change in his bodily and mental disposition, corresponds sufficiently nearly with what we observe when the lower animals are subjected to the same process. The minute organisation of his frame *undergoes change.* It becomes more delicate, sensitive, and impressionable. The food which agreed very well with the savage is totally indigestible by the civilised man, whilst its coarseness nauseates and disgusts him. The vicissitudes of climate and temperature which the half-naked savages, our forefathers, bore almost without sensation, would, without careful precaution, prove quickly fatal to the more delicate organisation of their descendants

We must be content, therefore, to take the organisation of our race as we find it. Its changes and variations are beyond the control of the physician, as of kings and governors. Changed it certainly is since earlier days, and changed it will continue to be under the ever-varying circumstances of climate, food, occupation, and mental cultivation. And changed, more than by all other means, it will continue to be by the excessive activity of the intellectual and social

faculties, a large portion of which, in man's primitive state, were in abeyance. It is futile, therefore, to talk about the pristine vigour and untainted constitution of our race in the golden ages before history began; both which, however, savour of the mythical. We have subjected the elements of nature to our use, and made daily companions of some of the most recondite and powerful of nature's forces. We must take the consequences of their reaction upon ourselves, nor quarrel with the Divine arrangement of Nature if great privileges and enjoyments are found to carry in their train greater responsibility to nature and to God, as well as increased susceptibility to pain and disease.

It is not more possible to give an exact definition of disease than it is to define the nature of evil. As with evil, so with disease, many of the data are of a purely negative character. Disease is the negative or opposite of health, as evil is of good. It is the better qualities, let us hope, which are active and positive; the worse, passive and negative. Health, like good, will vary by innumerable shades of difference in the case of each individual, and even in the same person at various times, and under changing circumstances.

Health may be, and indeed generally is, defined as the *normal* (proper) performance of all the functions of the body, that body being organised in a normal manner as regards the type of the

race; in other words, the proper action of a good constitution.

But when are all the functions duly and perfectly performed? When can we lay our finger upon a period of our lives and say, *Now* everything is going on within exactly as it should do; *now* I am in as perfect health as my organisation is capable of?

Again, who shall say what is a normally constituted frame? Who shall carry off the palm of physical perfection, and make the nearest approach to the Apollo Belvidere? Who shall decide upon the standard of physical beauty, or of perfection in constitutional power?

The hardy countryman can do without effort what it would almost cost the life of the puny citizen to attempt. Cold and heat, and coarse food, are *normal* circumstances to him, and we give him a high place, but by no means the *highest* place, as a human animal. But take him to the crowded town; place him in the close atmosphere of a counting-house, and keep his mind bent upon questions requiring abstruse thought, or upon matters demanding nice discrimination and acuteness of judgment, and where will he be? The bucolical giant cannot breathe in the confined atmosphere, and the mental strain confuses and worries him. His limbs soon lose their elasticity and his muscles their tension; and his once vigorous system falls into disorder or disease.

The pale and delicate citizen has here the advantage; *he* can endure the polluted air of the office or shop. His more subtle mind is not confused by intricate accounts; and he soon wears out his Herculean *confrère* if pitted against him in this element.

It is by no means certain, however, that the citizen has any real advantage in all this. As a *man* the countryman is, at least, his equal; possibly his superior. Your putting him into unnatural circumstances in which he broke down is no proof of inferior organisation or deficiency in natural talents. You have simply placed him where nature, mere nature, never intended him to live.

But the one situation may be as *natural* to man, as a cultivatable and civilising being, as the other. By the powers of his intellect, by the expansion of his social instincts, by his *natural* aptitude for inquiry and discovery, man becomes gregarious; a town builder, associating himself with his fellows for mutual aid and benefit. If by this proceeding his natural frame and constitution become modified, there is nothing unnatural in it. If, sheltered from the inclemencies of weather, from the extremes of heat and cold, his skin grows softer and his muscles lose some of their tension; if, in consequence of the complicated refinements of clothing, his skin assumes a more delicate texture and an increase of sensation; if, owing to the progress of cookery, his

palate becomes more educated and refined, until, by disuse, his stomach refuses to digest the rude fare of his barbarous ancestors, we are not therefore entitled to look upon these changes as marking *deterioration*, or as *unnatural*, unless we would ignore the purpose for which, we are taught to believe, our race was placed upon the earth.

If *Excelsior* be the watchword of our civilisation; if to perfect our moral and intellectual being be the tendency of the most refined systems of religion; if we are to strive to make ourselves as like to the image of the Creator as lies in our power, we cannot neglect the cultivation of our intellects, nor the refining of our social and moral instincts. And if these processes do bring about a higher degree of sensibility, of liability to be injuriously impressed by adverse circumstances, it is only taking the evil with the good, which, in our state of probation here, appears to be unavoidable.

All this progressive change, however, is not *disease*, nor is it any approach to it, any more than the inability of the negro to withstand the severity of our northern winters, or of the Englishman to endure the climate of Central Africa, is an evidence of debility. The frame becomes modified; the health also. The nervous system is developed at the expense of the muscular; and the faculties, both of mind and body, gain in activity what they lose in endurance.

The *balance* of the functions it is which is

altered; some of them assuming an ascendancy which they did not formerly possess, and others undergoing a corresponding diminution. From this cause, disease runs in other channels than it formerly did; its favourite manifestations are for ever changing, as is seen in the different pestilences and epidemic diseases which history records. Hence we invariably find that an alteration of physical circumstances, especially those connected with air and temperature, exhibits disease under new phases and characters.

But by long-continued use or stimulation of certain organs and functions, to the prejudice and disuse of others, disease *is* at length set up, and becomes the besetting sin of the *individual*. By subjecting generation after generation to the operation of the same abnormal circumstances, the *race* becomes affected; and thus what is called hereditary or family predisposition is established.

In this manner, a town population may become widely separated in point of the physiognomy of disease from a rural one. So that health and disease are becoming every day more and more relative terms, in consequence of this divergence from one standard mode of living and occupation, for all classes of the community.

In all remarks, therefore, which will be made in this book with regard to health and disease, let it be borne in mind that these differences should be allowed for, and that predisposition, whether it be hereditary or of that kind which is

derived from residence or occupation, is of the greatest importance in reference to the means of retaining, or of recovering, health.

Section II.—Characteristics of Disease.

The characteristic features of disease are almost infinitely various, but some of the leading ones may be noted here.

1. As to their origin. Diseases may be *inherited* or *contracted.* If inherited, they may either be present at birth or develope themselves at any time thereafter. Inherited diseases appearing at birth, of which small-pox and syphilis are the principal examples, may generally be cured with tolerable ease. But those which appear for the first time later in life are, for the most part, of an incurable character. Such are consumption, scrofula, insanity, and gout.

If disease be not inherited from parents, it must necessarily have been *contracted* by the individual himself. This may occur in *two* ways.

First, The organism, or bodily frame, may have been badly constituted from the beginning. This is what is commonly called a bad constitution. It may, therefore, be unable to bear even the ordinary or healthy action of the natural stimuli—air, temperature, food, &c; the slightest puff of wind will excite inflammation, and the least indiscretion in diet may arrest the powers of digestion. These are the cases in which the

greatest care and solicitude are required to avert, for a time, the natural results of this defective mechanism; and it is here that the intelligent modification of climate, clothing, diet, and occupation, will play the principal part in ameliorating the deficiencies of nature.

Secondly, The body may have been subjected to the operation of *unnatural* agents, such as the poisonous germs of epidemic diseases; or else to natural stimuli in excess, deficiency, or otherwise in disagreement with the actual condition of the system.

2. DISEASES VARY AS TO THE SOURCE WHENCE THEY ARE DERIVED. The sources of disease as regards the organism may be removable or irremovable; or, as it is now generally expressed, avoidable or unavoidable.

The first portion, or removable sources, embraces all diseases which have their origin in imperfections of the surrounding media—such as bad air, unwholesome food, exclusion of light, abuse of drinks, or of any of the natural functions; also of unwholesosme climates or employments.

The second comprises those diseases which result from ordinary atmospheric changes; or from epidemic constitution of the atmosphere; from particular seasons and localities; from the decomposition of the vegetation of the earth; and from the overflow of rivers, &c. &c.

3. DISEASE VARIES AS TO ITS MODE OF PROPAGATION. In this view, diseases have been divided into—

A. *Epidemical,*
B. *Endemical,*
C. *Contagious,*
D. *Sporadic.*

A. *Epidemic* disease is, if not in its birth, at least in its spread, of atmospherical origin. It seizes upon a large number of persons at once, or in quick succession. It spreads over a large surface of country; sometimes even over whole continents—passing over seas and lofty mountain-ranges, as was the case with the Asiatic cholera. Influenza, measles, scarlet fever, diphtheria, malignant sore throat, and whooping-cough are of this description.

B. *Endemic* diseases infest certain localities only. They are often limited to a very small area, and do not necessarily break out in severity at one time, but continue to hang about a district which favours them for an indefinite period; breaking out with fresh force ever and anon, and again subsiding to a minimum. Endemic disease may infest only a single village, valley, or plain; nay, it has been known to fix itself to particular houses, or parts of houses only. Such are typhoid fever, ague, yellow fever, goitre, or Derbyshire neck, and many less known forms of disease to be met with in particular regions of the world.

The causes of endemic diseases will be found in

some emanation from the soil, or from putrid animal or vegetable matter; particular states of the atmosphere; volcanic or other telluric influences in certain regions; decaying vegetable matters; and the overflow of rivers, &c.; a single foul drain may be the cause of endemic disease for a series of years.

C. *Contagious* diseases are those which, whatever their first origin, are *now* only propagated by contact, or by close proximity of one person to another, who is, or has lately been, affected with the same disease, or to clothing or other articles which have lately been in contact with a diseased person. Small-pox, scarlet fever, measles, whooping-cough, typhus, syphilis, itch, and some others, are good examples of contagious disease.

But diseases of other origin, and having other modes of propagation, especially the epidemic class, may become contagious under certain circumstances—such as great virulence, &c. They are then *both* epidemic and contagious; or we say that there is an epidemic of contagious disease—as of small-pox, or scarlet fever.

D. All other diseases are classed under the general term of SPORADIC, or solitary. They are those which arise in the individual himself, from causes peculiar to his own constitution; and comprise amongst them by far the larger half of all disorders. They do not acknowledge any of the modes of propagation peculiar to the other

three classes, and arise irrespective of climate, season, or other local or general extraneous cause. They are named sporadic, from *σποραδικός*—a Greek word signifying separate or scattered. In this class are included all those ailments which spring from an originally bad constitution, or from abuse of some one or more of the natural stimuli to life—as food, heat, air, exercise. They may assume either an acute or chronic character; whilst most of the others—epidemic, endemic, or contagious diseases—are essentially acute, and run a rapid course.

Amongst sporadic diseases may be reckoned inflammations of various organs: catarrhs, fluxes, dropsy, rheumatism, gout; affections of all the great viscera, such as the lungs, heart, stomach, bowels, kidneys, or bladder; as well as consumption, cancer, diseases of the skin, &c.—all of which may be either acute or chronic in their course.

CHAPTER II.

THE CAUSES OF DISEASE.

It will be necessary, in order to enable the general reader to understand the true tenor and bearing of the preventive measures which will be detailed in the next chapter, to say a few words upon the nature of those agents, internal and external, by whose operation disease is established.

Systematic writers are in the habit of dividing the causes of disease into two classes,—1st, the PREDISPOSING, and 2ndly, the EXCITING; or, as they are sometimes called, the *remote* and the *proximate* causes. As may readily be supposed, it is sometimes difficult to determine to which of these two classes any particular agent belongs; and, as is the case with almost all the operations of vitality, no very distinct line of demarcation between them can be determined.

SECTION I.—PREDISPOSING CAUSES OF DISEASE.

It is usual to give the first consideration to what may be called, logically speaking, the more general term—viz., *predisposition.*

Every experienced and observant physician

must be impressed with the all-important part which the natural constitution of everyone bears in relation to his proclivity to, or immunity from, disease. This popular term *constitution*, taken more definitely, is intended to imply the *force*, both as to direction and power, with which the bodily functions as a whole are performed. It is the *soul* of the *bodily* functions, as the conscience and the will are of the mental and moral; determining the bent of their operations, whilst they regulate their extent.

But this constitution, being a congeries of qualities rather than any *entity* or thing, must be dependent upon some structure; and its variations in different individuals can only be accounted for by the infinite variety which characterises the formation of the organs in different individuals.

Unless, therefore, we affix some such definite meaning as this to the term constitution, there will be no probability of the reader and the writer agreeing in their ideas of the subject under discussion, and all point and practical deduction may be lost in vague generalities.

If every blade of grass, every petal of a flower, differs from every other in some minute point, how much more the infinitely complex organs of the animal body, and especially of the king and head of the whole animal creation? No two faces are alike of countless millions, and we may be assured that no two units of those millions were

ever made exactly alike as to their *vital* organs. Function is the play of those organs under the stimulus of vital agents,—food, air, heat, &c. These agents are themselves infinitely various, and ever varying. How impossible, then, that the constitution of any two individuals should be exactly alike, or that the complexion of that of every individual should not also vary from day to day, from hour to hour!

And this is exactly what we feel to take place. No man is exactly the *same* to-day as he was yesterday, in structure or function; although his consciousness, his personality under any and every change, teaches him to be sure of his identity both in a physical and moral point of view.

Idiosyncracy.—In consequence of this universal operation of varying causes upon an infinitely varied organism, it comes to pass that every individual's constitution is possessed of what is called an *idiosyncracy*—that is to say, a tendency to move in a certain groove. He has mental, moral, and functional idiosyncracies — peculiarities of thought, of character, of bodily function. But as those of character and will may be enclosed within the bounds of general sanity, so may the oddities of his animal functions be restrained within the region of health. There will always be superior and inferior intellects, and intellects of an odd, yet perfectly sane character; so also there is a higher and lower degree of health, and also various eccentricities and diversions from

the usual standard, which must not be placed in the category of disease.

It is these peculiarities, marking the intensity of *individualisation* in our species, which make medicine *as an art* so uncertain, whilst its science is every day advancing, and attaining a more assured and exact position amongst its congeners.

A. HEREDITARY PREDISPOSITION. — Hereditary predisposition, of course, suggests the implication of more than one generation in the same tendency to some particular disease, or perversion of natural function. But it by no means follows that the parents should have openly manifested the *same* diseases by which their offsprings are attacked. It is enough that they lived in circumstances, *at the time the offspring were produced,* calculated, if long enough applied, to bring about such morbid tendency. Here is an example:—

A large portion of the lower classes pass their lives in circumstances which are certain to lay the predisposition to disease in the constitutions of their offspring. Their poverty obliges them to live in the lowest and most unhealthy parts of a town. The recklessness which poverty induces drives the husband to drink—perhaps the wife also. Deficiency of food is made up by gin or opium, or both; and what food they do get is spoiled by bad cooking. In fine, they live miserably and die prematurely, having given life to an offspring born to inherit the same squalor and misery as themselves.

Here arises the predisposition. The offspring suffer not only from the same diseases as their parents, but from others towards which their habits of life were leading them when premature death arrested their formation.

Here it is that the sins of the parents (follies and ignorances also) are visited upon the children to the third and fourth generation. The fathers have neglected the voice of God, expressed in the dictates of nature. Conversely, blessed are they to *many* generations whose parents walk according to light and knowledge, respecting nature, and fearing God, by observing moderation and sobriety in *all things*, and living in cleanliness, industry, and purity all their days.

The knowledge that success and high station in life are to be obtained and secured only by constant application induces the parent to keep his children to their studies too closely, and to force their intellectual development at the expense of the physical powers. Everyone is acquainted with the result. Monsters of intelligence, with bodies unable to carry it about; or else stupidity so dense as to be unable to form a single idea beyond those belonging to the merest animal nature. The choice between the two is not a delectable one.

This *education disease* rivets upon the children the bonds of perverted function which were forged by the parents. Their ill-developed organs may not be placed in any sanitary conditions preju-

dicial to health. Their food may be excellent, and fresh air may be, though it seldom is, supplied *ad libitum*. But the brain takes all the force which should stimulate the functions of the body; and, consequently, these will be unable to bear the force of the natural agents to which they will be subjected.

There is yet, however, no actual disease. But unless more favourable and natural circumstances are substituted for these artificial ones—less forcing of the intellect, with more out-of-door exercise—the constitutional powers smoulder in their birth for want of their proper stimulant, and the victim of the system at length sinks into confirmed valetudinarianism.

In both of the instances cited, predisposition to disease is born of parents whose organisms are *already* deteriorated; and, indeed, without such *primogenesis*, I know of no means by which hereditary predisposition, properly so called, can arise.

In one or other of these conditions here sketched out, variously modified in kind and degree, according to the varying circumstances of life, is to be found a large portion of every urban population. The process of deterioration goes on so rapidly in some instances that the generation dies out altogether; the vacancies being supplied only by fresh immigrants from the country districts. In other cases the constitution of a city population becomes modified,

and acquires a proclivity to certain morbid actions which are erroneously laid to the account of climate or some other natural cause. In this way, with various oscillations, according to individual temperament and circumstances, our city populations diverge more and more from the original type; and it is only by the constant accession of fresh supplies from the more rural districts that they can maintain themselves either in numbers or in manly vigour.

Born with these acquired proclivities to certain morbid tendencies, how are such persons to be rescued and restored, as far as is possible, to the pristine vigour of the parents? Errors of diet, either in the way of insufficiency or of excess; foul air, be it of the hovel or of the counting-house; distress, anxiety, or overstretching of the powers of the mind; too long hours of work, whether in the milliner's garret or the editor's sanctum; in short, the continued operation of any unsanitary cause will infallibly convert the *tendency* into *actual disease*, as the withdrawal of all such deleterious agencies will give the best chance of a return, at least a *part* of the way, towards the 'renewal of life.'

As regards the children of the poor born in the unhappy circumstances to which I have just adverted, the only way to rescue them from a fate as dreadful or a death as premature as that of their parents is early to remove them from their surrounding circumstances, and to place them

where the counterbalancing effects of good food, pure air, cleanliness, and activity can be brought to bear upon their diseased frames. To leave them in their native haunts is to leave them to become an early and easy prey to consumption, scrofula, and idiotcy.

Over and above these 'sins of the parents,' there is a defective organisation and congenital hereditary tendency to disease depending upon parentage, but unconnected with previous disease. Says Dr. Guy, 'Besides these hereditary diseases or predispositions' (just referred to) 'which may be transmitted from parent to offspring without any fault or imprudence on the part of the former, children are often born into the world of infirm constitution and prone to disease in consequence of circumstances referable to the marriage of their parents. Marriages contracted too early or too late in life, or between parties too nearly related in blood or presenting any great disparity of age, are open to this objection. The habitual state of health of the parents, and that of the mother during pregnancy, may also determine the future constitution of the offspring.'

In fact, the force and vigour of the constitution of the parents *at the time they are having children* is of supreme import to the future welfare of the offspring. Diversity in everything but age seems to react favourably upon the offspring, for the children of persons strangers to each other, in circumstances, country, and occu-

pation, seem to have an advantage over those born of parents long resident in the same town, frequenting the same society, and of similar tastes and dispositions. The baneful effects of actual blood relationship need not be adverted to.*

B. INDIVIDUAL PREDISPOSITION.—However unpalatable the truth may be to some invalids, a very common factor in the production of disease, or of weak health, is deficiency in the bodily structure. Moreover, this defect presents the most serious obstacle to perfect recovery from illness, and also induces a proclivity to a recurrence of the evil.

This circumstance is not always sufficiently adverted to by the medical practitioner, possibly on account of the unwelcome nature of the intelligence; and popular works written for the purpose of instructing the public in such matters are equally mute on this point.

All diseases, whatever their nature, cause, or character, fall into two great classes—viz. the

* The population of those towns whose families have long been closely connected with each other by repeated intermarriages, so that an individual scarcely knows in how many degrees of relationship he stands to his next neighbour, generally deteriorates both in numbers and in physical, and especially in mental, vigour. Such a population will be found to remain stationary, and averse to improvements and commercial enterprise. It prefers, like 'Little Pedlington,' 'stare in antiquas vias' to moving on at the invitation or under the auspices of strangers.

INTRINSIC and the EXTRINSIC; *i.e.* those which have both their cause and their origin from within the body itself, from something abnormal in its constitution or functions, and those which find at least their *exciting* cause without the body, and their predisposing causes in the habitual vicious use of some of the natural vital agents.

Let us try to reduce these ideas to practical utility. Bad health may be caused,—

First, By the structure of the organs being *defective*, and their functions consequently abnormal.

This defect, or imperfection, may attach itself to one or more of the following systems, viz.:—

1. *The Digestive*,
2. *The Vascular and Respiratory*,
3. *The Nervous*,
4. *The Muscular*.

Second, Any one or more of these systems may be subject to irritation, taken in its widest sense; that is to say, to disturbance from errors and vices in the daily habits of life; from a wrong use of those agents,—air, food, heat, light, exercise, sleep, &c., from whose natural and judicious employment only health results.

We will take first the defects of structure and constitution, whether they have been born with the individual or acquired by him afterwards.

1. DIGESTIVE SYSTEM.—Probably no other function, or group of functions, presents such various and eccentric characters, still within the boundary

of health, as that of digestion. These characteristics are frequently inherited; they are as commonly peculiar to the individual only; they are often acquired by errors in diet, &c.; and they as frequently acknowledge a totally different cause, foul air operating quite as detrimentally as bad food.

In such cases, unless the greatest care be taken, the stomach is always morbidly irritable, and requires coaxing and humouring to perform even its *proper* duties. People of otherwise strong frame and powerful muscles are often subject to these dyspeptic miseries, especially those of the bilious temperament.

And what Protean form does not indigestion assume? How innumerable the stomach's *idiosyncracies*! Hence it is that in the matter of digestion nothing can certainly be predicated as beneficial except what has been certified by the test of individual experience.

2. VASCULAR AND RESPIRATORY SYSTEM.—The vascular system includes the heart, the arteries, the veins, and the capillaries, with their contained blood.

Various departures from the normal state occur in this, as in the digestive system. Its organs may be too large or too small for the rest of the body; or if of normal size, their *tone* may be defective, and inefficient action will be the result. People of large size, particularly those of the so-called lymphatic temperament, have

often a weak circulation, owing to the want of power in the muscular substance of the heart and of elasticity and tone in the vessels through which the blood circulates. They are, consequently, easily fatigued. If females, their legs swell with slight exertion; and they are subject to palpitation, giddiness, and loss of appetite, on any unusual strain being put upon them. Individuals with very light hair and eyebrows, and clear complexion, but with soft, pulpy flesh, and full stomachs, are the type of this temperament. They bear cold badly; and the young are subject to chilblains and cold extremities.

The respiratory organs are frequently defective from birth; the chest being too narrow, pigeon-breasted, or too flat. This often arises from the lungs not being properly inflated at birth, or from inflammation at an early period destroying the usefulness of a large portion of their structure, which shrivels and wastes away. Exercise, although in moderation so useful in improving this defective organisation, cannot be borne by such persons beyond a very moderate degree; the same breathlessness, palpitation, fainting, giddiness, &c., being caused by over-exertion as in the case of weak heart.

3. THE NERVOUS SYSTEM.—I said that the digestive organs carried away the palm for eccentricity of function and proneness to irritation from all the other *systems* into which the vital motions are distributed. I might have excepted

the nervous system. For its aberrations, both as regards the physical and the mental processes under its control, are innumerable. And not only are its proper functions so variable within what must be regarded as the boundaries of health and sanity, and so easily deranged under improper stimuli, but its aberrations are reflected upon all the other functions. Thus the heart and the stomach are as often deranged by the condition of the central nervous system—the brain and spinal marrow—as they are by any noxious agent applied immediately to themselves.

And not only are the various vital functions under the dominion, and, so to speak, the *caprice* of the head office of the nervous system, but they are all held in check, excited, depressed, or perverted by the action of the sympathetic nervous system.*

This omnipresent system provides for the wants and necessities, and even the emergencies, of each organ to which it is distributed, and brings them all into correspondence and *sympathy* with each other. Its action may be compared to that of the electric telegraph, by which messages

* This elaborate and ubiquitous distribution of nervous sympathy, or *organic sensibility*, is more general throughout the animal creation than even the existence of a brain; and must therefore be looked upon as the prototype, the essential and fundamental form, of a nervous system. Even plants have been supposed, erroneously no doubt, by some vegetable physiologists to possess a nervous system somewhat resembling this fundamental one of animals.

are sent either direct from one end of the wires to the other, or by the most devious routes through its minutest ramifications.

The degree of tone of the whole nervous system, and, as I believe, of the great sympathetic in particular, may be taken as a measure of the health, feelings, and energy of any individual. If the tone be at a high pitch, he will be capable of undergoing a large amount of exertion, either bodily or mental. If it be lax, he will become languid, and incapacitated by the smallest demands upon his powers. The body may be spare, delicate, and under the average size; yet this *tension* of the nerve force will keep it going in full activity, just as the blood-horse, with his slender muscles and delicate sinews, will beat the heavier half-bred when their respective powers are put to the severest strain.

This nervous tension, or *usable force*, depends upon two circumstances:—*First*, Upon the *quality* of the brain—substance and structure. If the *quality* be not originally good, no after management will make it so; although it cannot be doubted that proper exercise of the mental faculties is as beneficial to their development as those of the body are in the case of the muscles. Mere size, however, is no criterion or measure of the intelligence, any more than of the physical powers. The muscles contract upon the stimulus of the nerve force; and it is *this*, and not the size of the muscle, which determines whether the resulting effort shall be languid and feeble, or

rapid and vigorous. *Secondly*, This nervous tone depends upon the general state of the nutrition of the body and the healthy condition of the several organs; all of which react powerfully upon the brain and nervous system.

I have already stated that the eccentricities and aberrations of the nervous system are endless. It is civilisation which produces the principal examples of them. The nervous functions of the cultivated lady of high life differ from those of the country milkmaid almost as much as if they were of two different species; certainly as much as the latter differs from an Australian savage or a North American squaw. The latter bears with stolid indifference sensations which vibrate through every chord of the delicate lady's organism; whilst, on the other hand, use will entirely deaden the feelings of the lady to some of those natural stimuli which causes every nerve of the rustic's body to tingle with delight.

The constant strain of the attention upon one subject or class of subjects causes the mind to become in time unimpressible by the same class of sensations. The powers to which they appeal have become exhausted, and can only be restored after a period of rest. By thus constantly keeping one or more faculties of the mind on the stretch, the same kind of exhaustion is produced as when one set of muscles is unduly exercised. If we call a different set of muscles into operation, whilst we relax the former, some relief will be

experienced, but the nervous power which guides the whole will, nevertheless, become exhausted. It is the same with the senses and the mind. Although one sense or one faculty may be called upon to take the post of sentry while the others rest, still every other faculty sympathises, and the gradual exhaustion of the whole system follows the too constant strain upon any one of its parts.

The result of over-work is loss of tone; that languor of the mind which overtakes the over-anxious and energetic, who think that because no diminution of their powers is felt immediately to result from over-strain, none is to be dreaded.

One of the signs of want of tone in the nervous system is moral indecision. The judgment, when actually called upon, may be as sound as ever, and the perception and apprehension as clear, but the will is deficient in force. Hindrances and difficulties before despised now assume gigantic proportions. There is always a 'lion in the way.' From ever taking a hopeful and cheerful view of affairs, a despairing melancholy and dread of ill take possession of the mind, damping its energies and quenching the fire of genius and talent.

On the part of the bodily functions, this defect of nerve force shows itself especially in slowness of movement—fatigue being more readily induced than formerly—and by a diminished action of nearly all the functions. In fine, the temper becomes uneven, the resolution unequal to the

occasion, the judgment uncertain, whilst the animal functions become deranged from slighter causes than formerly.

Debility and irritability now go hand in hand; and soon other and more serious consequences ensue. On the part of the intellect, absolute imbecility, or delusions and hallucinations, mark the entire *bouleversement* of the mind; on the part of the body, various derangements of the stomach, heart, liver, lungs, kidneys. The withdrawal of the due amount of nerve force deranges the play of the functions; nutrition diminishes, and degeneration is not slow to follow. Fat is now deposited in the place of muscle; fibrous substance in the liver and kidneys replaces the proper structures; the heart becomes enfeebled from loss of muscular tone, and dilatation of its cavities; while dropsy, apoplexy of brain or lungs, or some other fatal disease, completes the catalogue of evils the result of over-strain upon the nervous system.

Muscular system.—Malformation or debility of the muscular system shows itself chiefly in defect of mechanical power, but it is more remediable by exercise and proper attention to the development of the system generally than defect in any other group of functions.

Section II.—The Exciting or Proximate Causes of Disease.

It should be kept constantly in mind that there are two factors which go to the production of any disease or disordered state of health—viz. the predisposition just described, and the operation of some agent, either within or without the body, which excites the morbid action to which the system has become prone.

If the predisposition to any kind of disorder be great, and the exciting cause operate forcibly, then we may be sure that the resulting disease will be of a violent or profound character. It is the conjoint effect of two forces acting together in their highest degree. Conversely, if we remove the predisposition to a certain disease, its peculiar exciting cause will either fail to act altogether, or its efforts will be slight and comparatively innocuous. Or we may avoid to the utmost of our power the exciting causes of those diseases to which we may be predisposed, and so no opportunity of lighting up their fires will occur. The highest theoretical condition, therefore, of course will be where the bodily structure and functions are so perfect as to have no predisposition to disease at all; whilst the happy individual, with wisdom equal to the excellence of his constitution, avoids every external cause by which it might enter. Such are those fortunate people whom

we hear of as arriving at the age of 80 or 90 without having ever experienced a 'day's illness.'

It is more important to remove predisposition to than to avoid the exciting causes of disease, because we have the former more within our own control and daily observation; whilst the *exciting* causes will be often present, and operate in spite of every precaution. By reducing or removing predisposition, therefore, we lessen by one, and that the *greater* factor, the chances of disease making its appearance at all; and, at all events, we may safely calculate upon moderating its virulence and materially lessening its fatality. Upon this fact rests the foundation of nearly all our *public* sanitary regulations and measures, and the almost more effective attention to *personal* health.

This is the *rationale* of sending persons predisposed to consumption or other scrofulous disease to such climates as will admit of their passing more time in the open air (for it all comes to this) for a longer portion of the year than they are able to do in less favoured climes.

This, too, is the reason for keeping persons predisposed to gout upon plain and easily digestible viands; and, in general, for removing any individual from those surrounding circumstances which tend to keep up a predisposition to any form of disease.

There is a kind of elective and reciprocal action between these two sets of causes—the pre-

disposing and the exciting; so that they seem, like crafty hounds which hunt in couples, to combine their forces, in order to determine from a single cause that form of disease to which each individual exposed to it is especially prone. This fact is illustrated in the following case:—

Suppose five or six individuals to be exposed to some morbific agent or unsanitary situation; *e.g.* great cold. One of them shall be afterwards attacked with rheumatism of the joints; another with tic doloreux, sciatica, or some other form of neuralgia; a third will have a catarrh or bronchitis; a fourth, congestion of the lungs or liver; a fifth, exhaustion or mucous flux of the stomach; and so on. How, it will be asked, does one and the self-same cause excite such widely different disorders? The answer is, because the cold, as the exciting cause, is only so of disease—disease *in general*, not of any *particular form of disorder*. It is but *one* factor, and *alone* cannot determine what the resulting effect shall be. The proper and specific action of cold is simply exhaustion of the vital powers, and in its greatest degree causes death by exhausting and benumbing the vital force of the nervous centres.

The determining cause, acting *with* the cold, is the predisposition, the *tendency*, to certain forms or classes of disease; and this depends upon the *condition of the organs previous to exposure* to the exciting cause—viz. the cold. The person who had an attack of rheumatism was not in a

healthy state to begin with. There was already formed in his system a certain amount of an organic acid matter, which the body was getting rid of as best it might by the several excreting organs—the skin and the kidneys in particular—when this exposure to cold checked the natural processes, and threw back the morbid material upon the current of the blood. In this case, the swelling of the joints, the acid perspiration, the urine loaded with lithic acid, are only so many indications of the struggle which the system is making to get rid of *the products of* the disease; they are not the disease itself—*that* is in the blood. Allied to rheumatism are those neuralgic affections—tic, sciatica, &c.—which were exhibited by our second individual. Impure blood was also circulating in *his* system; and the effect of cold was simply to cause it to be congested in the vessels supplying the nerves—thus exposing those sensitive chords to poisonous matter as well as to pressure, which they always resent. 'Pain,' it has been well said, 'is the cry of the nerve for healthy blood.'

It is the same with the *third*, who received a catarrh or bronchitis. There is little doubt but that these inflammatory attacks of internal organs are determined by a previously disordered state of their circulation, or of their nerve force, or of the blood supplied to them. Either of these conditions being present in any organ, that organ is weaker, comparatively, than the rest of the

body; and the general congestion of blood which the exposure to cold induced affected that organ more than any other.

The fourth and fifth examples differ from those just named. Congestion of the lungs, liver, or brain may result from cold (and from heat also) without there having been any morbid condition of the system previously existing. The blood is merely driven from the surface, and thrown upon these internal organs with undue force. They are *crowded* with blood, and cannot pass it on fast enough to escape the ill effects of congestion. Here, then, it may be said, there was no predisposing cause in operation, and *one* factor, cold, has produced all the disorder.

Only in appearance, however. The cold in these cases acted both as predisposer and exciter. The first portion of the exposure, by abstracting much heat from the body, reduced the tone of the whole system, the vital force of every organ; the continuance of its application caused the weakest organ to become unduly distended with blood, owing to the debility of its vessels being greater than that of the rest of the system. Never are all the organs of the body in an equal condition as to tone, any more than in freedom from disease. Weakness alone is a great predisposer; and so in the body natural, as well as in the body social, it is always the weakest which 'goes to the wall.' This fact is well illustrated in the case of gout. A 'martyr' to this painful disease has a

remission, temporary freedom from his tormentor. After a time, however, his general symptoms warn him that an attack is impending, but he does not know where the blow will fall. At this time he stumbles, and twists his foot or his toe; and straightway, next day, gout appears in the weakened member. Or, it may be, overuse of his wrist and fingers in writing, or other manual labour, will bring the gout to the fingers and wrists; or a debauch, by temporarily distending and weakening his stomach, will cause the blow to fall upon that vital organ—the fatal consequences being often wrongly attributed to *metastasis*, or removal of the gout from some joint to the internal organ.

Previous attacks of the same disorder, or an allied disorder, act as powerful predisposers to disease, by permanently lowering the vital properties of some organ, as well as the tone of the whole system. This is especially the case with gout, rheumatism, erysipelas; and with diseases of the bronchial and other mucous membranes, as that of the stomach, intestines, kidneys, bladder, &c. Perhaps an organ which has once been seriously implicated in disease never fully recovers its pristine purity. Its vessels remain weak, or its nerves continue irritable; and the same causes which formerly originated the first morbid action need now only be applied in continually lessening degree to produce the same *effects*. Everyone knows how ready convulsive

and epileptic attacks are to recur when they have once made their appearance. The system seems to cease to struggle against them; just as a horse which has once been down takes less heed against stumbling in future.

It will be understood, then, that the *exciting* causes of disease embrace every noxious influence to which the body may have been exposed just previous (within a few days, in the great majority of cases) to the appearance of the particular disorder; and which influences we know, both from long experience and from physiological induction, to be capable of producing such effects.

They divide themselves into two very distinct kinds:—

First, The natural agents—air, light, heat, food, drink, exercise, &c.—applied in undue force or degree, although their normal application is productive only of health.

Secondly, Unnatural and morbific agents (or the natural agents in an impure state), derived from animal or vegetable exhalations, or from some partially known atmospheric or telluric influence, or, as supposed by some philosophers, even from some universal cataclysmic actions.

Then, in the first class, the very air we breathe, the warmth we luxuriate in, the food we imbibe, the exercise we take, may each and all, in place of conducing to health and strength, by untimeous or inordinate use, *which is abuse*, be

productive of nothing but debility, disease, or even death.

Yet time is generally necessary to produce any serious amount of mischef from the abuse of these *natural* stimuli to life. So tolerant is nature of injurious treatment, as long as she recognises any congruity of the elements with her requirements, that she will endeavour with all her might to resist or remedy those evils which result from any excess, deficiency, or perversion of the use of the natural gifts. Thus, she will manfully struggle against the attempt of the idle and self-indulgent to suffocate her by repletion, or of anyone to freeze her with cold, or poison her with foul air, or to exhaust her powers by over-exertion, provided the exertion be of a natural kind.

Thus, superabounding luxury, pinching poverty, labour too severe, or idleness carried to the length of total inertion, may each, or any number of them together, batter away at the portals of health for a very long time before the fortress show any signs of surrendering to the assaulters. But no fortress, however well manned, bravely defended, or impregnably situate, can hold out for ever against an ever-watchful and determined foe. Proper supplies of nourishment cut off, destructive elements continually thrown in, will wear out the resistance of the most enduring fortitude and courage. Therefore it is that *degeneration must* follow long-continued ill

nourishment of the tissues, debility and exhaustion their long-continued over-action; and then the resisting powers will no longer possess any basis of operations. The functions must necessarily change with the altered condition of the organs which they represent, and DISEASE take the place of HEALTH.

The *second* class of the exciting causes of disease differs *toto cœlo* from the foregoing. Here we lose sight of heat and cold, food in excess or deficiency, of good or ill quality, pure or foul air, too little or too much exertion. We pass out of the region of the naturals into that of the *non*-naturals, and recognise poisonous or morbific agencies, which are equally to be found ready prepared by nature as are the most beneficial elements by which we are surrounded.

Nor do all these noxious agents come from without. We manufacture a great part of them in our own systems. Those matters which in health the system is so careful to thrust out may be retained in the body, and prove as actual and potent poisons to the individual as his exhalations do to others.

There are two classes of poison which are manufactured within the frame itself. The first are either certain products of imperfect digestion or assimilation of food and drink, or the deranged secretions which the system is unable to maturate and bring to perfection. The acid matters which circulate with the blood, causing the phenomena

of gout, rheumatism, and probably neuralgia, are of this kind. These substances result from imperfect digestion—a too rich and stimulating, and, again, from too poor a diet. Unable to effect their exit as fast as they are produced at the usual emunctorial organs—the kidneys, the skin, the lungs, &c.—they are deposited by the blood in the joints, tendons, muscles, or nerves, according to the comparative debility or *receptivity* of these several systems of organs. Thus rheumatism affects first the joints and muscles, being the parts most exerted and most readily exhausted. When the poverty and perversion of the blood, with the attendant fever, have reduced the heart's powers, then the disease attacks that organ itself, disorganising and, if not speedily dispelled, spoiling its structure for ever after. In like manner, gout, after it has reduced the system by repeated attacks, and enfeebled the internal organs, will seize upon the heart and stomach, making the last state of the unhappy patient much worse than the first.

A morbid material also circulates in the blood in many kinds of skin diseases—as in eczema or tetter, and in leprosy, erysipelas, &c. This is equally derived from indigestion. Again, the secretions, which, instead of passing out of the body, are sometimes retained in the blood—such as bile and urea—act as poisons to the system, and are often as deadly in their effects as the *poison* of a serpent.

These morbific matters affect the *individual* only. He keeps his *poison cupboard* to himself, and however he may suffer by his ignorance or folly, he does not infect other people with his malady. You cannot communicate rheumatism, gout, neuralgia, eczema, jaundice, kidney disease, to another by contact or inoculation. They are, nevertheless, *specific* diseases—that is, they are always caused by the same *materies morbi*, or poisonous substance; and each kind of these matters is able only to produce its own special symptoms.

The *second* class of these poisons differ from the other in this—that they are *always* introduced from *without*. Moreover, they are entirely *specific*—viz. each poison produces its own effects and no other; a form of disease caused by any one of them *never* passes into a form caused by another. How the poisons which generate these diseases first originated is still unknown, but we have the strongest grounds for concluding that *now*, at least, their corresponding diseases *never* arise except by the application of the specific poison. These diseases are what are called the zymotic; meaning by that term the introduction of a morbific substance into the body which operates as a *ferment*, very much as yeast does in a saccharine fluid. All the material which can be used in the body to multiply the morbid poison is laid hold of; and a new supply of the poisonous

matter created which is sufficient to infect great numbers of fresh individuals.

The most typical specific diseases are small-pox, chicken-pox, measles, scarlet fever, whooping-cough, ague, yellow fever, typhus, Asiatic cholera, and some diseases of the skin. Every one of these diseases is propagated by germs or atoms of matter, which arise, or have arisen, under various conditions of the human body, or of the soil, or the atmosphere. Each disease is caused only by the application of *its own* peculiar germ; and in most instances these germs are multiplied in the body in the progress of the disease, and passed on from one individual to another by means of infection.

It is quite unnecessary to remind medical practitioners of this specialty of contagious diseases, but it is highly desirable that the public should be better instructed with regard to them than they now are. Reckless statements impugning the specific origin of these diseases have been made upon apparently high authority, but without any foundation in fact; and, consequently, the public have been thrown off their guard against infection, and taught to believe in the origin of small-pox, scarlet fever, typhus, &c., from dirt and unventilated dwellings *alone*, without the intervention of the all-powerful *germ*, the *sine quâ non* of specific disease. But no one ever yet saw this class of disease so arising. No one has been able to prove that they have been found

in places, or affecting persons, where the germs of the disease have never entered. Whole continents and islands have remained total strangers to small-pox and others of this class of diseases, until they have been introduced by Europeans, and *then* the disease has spread with the most fearful virulence and rapidity. Some of these contagious and self-multiplying diseases are due to an animal, and some to a vegetable origin; while there is reason to believe that electrical or some other cosmical action operates in the first introduction of others, and in the spread of most of them. Small-pox, scarlet fever, measles, whooping-cough, typhus, and probably typhoid fevers and some skin diseases, are clearly propagated by animal matter thrown off by the sick, which enters the bodies of others by way of the breath, the saliva of the mouth, the skin, and by food and drink contaminated with poisonous germs. Some of them are harmless, like the poison of a serpent, if applied to certain tissues, selecting their own peculiar mode of entering the system. Ague, marsh fever, and yellow fever are owing to vegetable matter, or, at least, to emanations from the soil which contains it. The origin of cholera morbus, and perhaps some of the terrible epidemics of the Middle Ages, is more obscure. Some peculiar condition of the atmosphere, extending over vast regions of the earth's surface, appears to be necessary to the *spread*, at least, of these epidemics. Whether

the actual germ be of an animal or a vegetable nature, or even a non-organised substance, is still *sub judice*. The older observers believed that earthquakes, volcanoes, and some occult emanations from the interior of the earth were the cause of pestilences; whilst in still older times the question of their causes was easily dismissed by a reference to the anger of the gods, or the miraculous intervention of a better known Providence.

It should be well understood that unsanitary conditions—filth, overcrowding, foul air, bad food or drink, impure water, by lowering the general tone of the system—predisposes the persons so affected to these formidable diseases. Such conditions of living *prepare the soil* to receive and nourish the germs of specific diseases; and there they multiply and thrive. Hence it comes to pass that the inhabitants of the worst and filthiest parts of towns, as well as those who keep dirty houses anywhere, are more liable than others to these plagues, and succumb to their attacks with less resistance. But still the germ *must* be applied.

It cannot be denied, however, that the healthy, the strong, the cleanly, the well-fed, are often attacked by specific diseases; and some epidemics have been known to select such subjects by preference, as it were, for their victims. This was the case in the celebrated 'sweating sickness' which infested England and Europe in the fif-

teenth and beginning of the sixteenth centuries. At the same time, it is so difficult to know who is a sound and healthy person, and the germs of disease begin to vegetate and strike root so deeply into the frame before we become conscious of their doings, that mistakes are easily made as to the robust health of the victims to this or any other epidemic disease.

It is evident from these facts that no sanitary provisions *alone* will ensure immunity from these specific and contagious diseases; and those who have asserted the contrary, and taught men so, have a good deal to answer for. Provision must be taken to avoid contagion, and to destroy its virus wherever present. Infected individuals ought to be isolated during the period when they are capable, by their persons or their clothes, of communicating disease. A much larger provision in the shape of HOUSES OF REFUGE, and FEVER HOSPITALS, and wards than now exists in our large towns is imperatively called for; and although the Legislature may hesitate to protect the great bulk of the people by interfering with the liberty of the few, it is quite clear that persons have no more right to carry about contagion, or make their houses *foci* of infection to their neighbourhood, than they have to keep gunpowder on their premises, at the risk of blowing up their neighbours' houses, whilst recklessly destroying their own.

How far the great scourge of infectious diseases

might ultimately be banished from civilised life, of which they are the product and the curse, by due attention to public and private cleanliness, to sobriety in eating and drinking, to a proper supply of fresh air, food, and exercise, *conjoined with careful weeding out of the cases as they occur*, it is impossible to tell. But we may be assured that it is in that direction only that we can work towards their hoped-for annihilation. So long as every facility is afforded for the germs, which are sown broadcast by the atmosphere and the winds over city and village and rural dwelling, to multiply themselves by presenting to them a constant succession of victims, so long will our houses be made desolate by the ravages of scarlet fever and measles, so long will female beauty and manly vigour be marred by small-pox and other loathsome diseases of the skin.

But every person may take precautions to a certain extent against the *imbibition*, as well as against the *propagation*, of contagion. The former can only be done by carefully keeping out of the way of infection; the latter will necessitate the use of disinfecting agents, the proper use of some of which will be described in the Appendix.

CHAPTER III.

THE ART OF AVOIDING DISEASE—GENERAL PREVENTIVE MEASURES.

In another work,* to the objects of which the subject is more germane, I have aimed at instilling into the reader's mind clear notions of the nature and causation of health, as in the preceding pages I have glanced at the nature and causes of disease. For it is impossible for any one to follow in an intelligent and judicious manner the general directions either of the physician or the hygeist, without having first formed correct ideas respecting the operation of the natural agents upon the human body in the production of health and disease. It seemed necessary, also, that the reader should be at no loss to conceive the part which predisposition, whether inherited or acquired, plays in modifying both health and disease, and how the ordinary exciting causes—heat, cold, improper food or diet, over-work, anxiety of mind, &c.—work *together with* the predisposition, so as to give to every

* 'The Seven Sources of Health,' 1864.

case of illness an idiosyncratic or individualised character.

The removal of causes or the prevention of disease will, therefore, *for the individual*, always possess something of a special nature. Experience will teach each one how far general laws must be modified to accord with his own peculiar case; and thus by the time he reaches forty years of age he may be set down, according to the saying, as 'either a physician or a fool.'

But no one who lives in a town can be sure of any of the prime necessaries to life, in a condition of purity, unless *all* combine and agree to do their utmost towards removing all impediments to the circulation of pure air, all impurities which may contaminate the drinking water, all processes by which food is adulterated, deteriorated, or rendered dear. Hence the necessity (how late in the history of modern civilisation for it to be seen!) for public edicts requiring *everyone* to observe the most obvious sanitary rules, and to contribute towards the maintenance of the municipal machinery for carrying them into effect.

It is no part of my plan, however, to describe those public sanitary measures which are necessary for the maintenance of public health. These have been fully set forth in numerous publications which have resulted from the impetus given to the subject by the passing of the Health of Towns Act, as well as by the invaluable labours of the pioneers by whom the way was prepared for

the introduction of sanitary measures. All that I shall say here is, that the general healthiness of any dwelling can only be guaranteed on *three* conditions, viz.—

First, The constant introduction into that dwelling of pure air from without, and the escape of foul and used-up air from within. This *sine quâ non* of all sanitary provisions can only be effected by the removal of all substances from the *neighbourhood* of the dwelling which are capable of rendering the atmosphere impure. Such are filth in the streets, courts, or houses; unclean drains, catch pits, or cesspools; decaying animal or vegetable matter of any kind; foul or stagnant water, and the bodies of persons uncleanly or ill of any contagious or epidemic disease.

The *second* condition is the personal cleanliness of every inmate of the dwelling, only to be effected by the regular and daily removal of the effete and poisonous matter which exudes from the skin, as well as the scrupulous cleanliness of water-closets and privies. Many a family is chronically poisoned by the regurgitation of foul air from a sink, drain, or closet on the premises. See that all these are *constantly* flushed and well trapped, and there will be no fear of, at least, *one* insidious disease—viz. typhoid fever. Pure air, pure water, and wholesome food actually annihilate typhoid fever.

The *third* condition of household health con-

sists in maintaining a proper temperature and an abundance of light. Whatever be the temperature out of doors it matters comparatively little to the healthy, because they can take exercise in proportion to the amount of animal heat required to be generated. But it is another thing in-doors. There the weakly, the young, and the aged—using, perhaps, little or no exertion to generate warmth—suffer immediately if the temperature of the atmosphere in the dwelling fall below 55°. They are robbed of their warmth faster than their feeble powers can generate it; and thus their vital powers are as certainly exhausted as though they were deprived of food.

Nor is light of less consequence. All vitality languishes in the dark. Tissues become soft, brittle, inelastic. The mind becomes inert and the senses dulled from want of their proper stimulus. 'Where there is light there is thought,' was a fine saying; and where there is not light there is no cheerfulness, hope, cleanliness, morality, nor religion. In every sense light and life are interchangeable terms; the absence of the former, whether physical or moral, entailing the negation of the latter.

These necessary preliminaries being assumed, I pass on to the consideration of the phenomena of the nature and causation of disease more in detail, with a view to their application to individual practice in warding off disease, and in removing its 'germs and vestiges,' whensoever

they are discovered to exist. After making ourselves acquainted with the operation, for good or for evil, of the natural agents upon the human system generally, we should set ourselves to study their particular application to our individual organism. This constitutes the art of *private* hygiène, or *personal* health, variously designated by individual writers—as the 'Art of Prolonging Life,' by Hufeland; the 'Code of Health and Longevity,' by Sinclair; the 'Philosophy of Living,' by Mayo; the 'Philosophy of Health,' by Southwood Smith, &c.

In order that our observations may not be frittered away in vague generalities of little practical utility, I propose to consider this subject under the fourfold aspect which was assumed in the last chapter, and examine the disposition to disease of each set of functions separately.

Preventive, as well as restorative, measures will have reference principally to the existence of—

First, A *tendency* to derangement of the digestive organs.

Second, A *tendency* to derangement of the circulatory, respiratory, and secretive organs—viz. the heart, lungs, liver, kidneys, &c., commonly known, with the digestive, as the organs of nutrition.

Third, A *tendency* to derangement of the organs of sensation, thought, and, will—viz. the brain and nervous system.

Fourth, A *tendency* to derangement of the

organs of locomotion—viz. the bones, ligaments, and muscles; and

Fifth, To the existence of morbific germs of disease which have their habitation in the atmosphere.

Section I.—The Tendency to Derangement of the Digestive Organs.

No physician, with any pretension to philosophical or successful practice, will content himself with removing the present symptoms of disease, but endeavour to search out their remote causes, and, by removing them, not only restore the patient to present health, but guarantee him, as far as is possible, against a recurrence of the evil.

So, in our efforts to prevent disease, we must go to first or predisposing causes. These will not act of themselves; it should, therefore, be our object to remove them, or else to remove the patient out of their influence, before he can be subjected to their ally and coadjutor, the *exciting* cause. Every invalid knows with what facility and from what slight causes a customary disease will return, so long as the original predisposing causes remain in operation. Remove these and the excitor is deprived of his ally; for these two causes pursue the same course as burglars—the thief without has generally some confederate within to whose assistance his successful attack upon the house is owing.

The digestive organs are particularly open to these observations. I do not know that they are more frequently the subject of inherited peculiarities than some other organs; perhaps they are not. But the daily habits of life, of diet and regimen, and the customs of society, press their functions into certain *grooves* or peculiarities of action, to which they adhere with great pertinacity.

And no wonder. For the central organ of the digestive functions, the stomach, is so intimately connected with, and sympathises with, every other organ of the body so immediately through the elaborate system of the organic nerves, that nothing can take place in any one of them without its immediate cognizance. Placed in the very centre of the body, with the largest ganglions and plexuses of this great nervous system behind it or in immediate proximity to it, the stomach may be looked upon as a central emporium—a seat of organic empire; ruling the functions which administer to mere life much more despotically than does the brain and spinal chord.

Preventive measures, therefore, to be effectual and complete, must be as universal and far-reaching as are the connection and sympathy of the digestive organs with every other, and with every natural agent by which they are affected.

To begin at the beginning. We endeavour to correct any inborn or hereditary tendency to

mischief. There is no doubt but that many of the present generation are suffering for the sins of their fathers in the past. The unlimited and frequently badly cooked food; the port wine topped up with brandy, the strong heady ale, did their work upon *that* generation, but it is *this* which suffers for it. 'Show me the children,' said a French *dame d'esprit*, 'and I will tell you how the father passed his youth.' So the gout of the father becomes the irritable stomach of the child, and the impurity of his blood, generated by gross living, comes out in scrofula, marasmus, and consumption in the offspring.

And this inherent defect or proclivity to disorder is too often fostered and made permanent by the most unwholesome practices. In place of country air and sun-light to harden his soft and ill-elaborated tissues, the child, if *unfortunately* born in the easier ranks of society, is confined for twenty-three out of the twenty-four hours to a hot and close nursery by day, with no breeze to stimulate his skin and excite the action of his lungs, whilst he is half suffocated by fire, gas, and bedclothes by night. Instead of plain food, easy of digestion, which is alone capable of supplying normal chyle without arousing the dormant irritability of the stomach, highly composite and heating and indigestible substances are forced upon him with a view to tempt his jaded appetite, whilst he is still further plied with pastry and sugary messes between meals,

which speedily run into acescent fermentation, and then stimulants must be given to make all these strange substances agree with each other. This is like committing murder to hide the traces of assault and battery.

A disposition to digestive disorder in children is shown by slow and imperfect digestion, with disordered bowels; hot dry skin, on which eruptions frequently appear; pale, flabby cheeks; white furred tongue; and a disposition at once restless and easily depressed. They should be treated as having inherited a tendency to disorder of the digestive organs, 'from which more than one half of human ills do spring.' Constant fresh air is the only certain remedy for this state of the system. Active exercise in the open air will cause a demand for fresh blood; and a free admission of oxygen to that fluid, *unmixed with pernicious emanations from persons or foul things*, is essential to the elaboration of healthy blood out of the food. It is folly to *begin* with the digestive organs themselves. The fault is not there only; the blood is not in a condition to secrete good gastric juice, and therefore no perfect digestion can be performed.

This vicious circle which the digestive functions get into is further perpetuated when the nervous energy is withdrawn from the vital organs, and concentrated in the brain upon intellectual pursuits. A weakly or debilitated child has not enough of this energy to *grow* well with, and to

learn well with, at the *same* time. If one is forced, the other must suffer. All this is trite enough, and has been dinned into the ears of parents and teachers *usque ad nauseam*. Nevertheless, the system of *cramming* still goes on; cramming of the stomach with crude material for the blood and nerves, and cramming the intellect with crude and ill-elaborated material for thought and moral force.*

One of two things must *necessarily* result from forcing the intellect at the expense of the digestive functions in youth and early manhood. Either the mental powers, being of more than average order, will absorb to themselves all the vital energy of the body, draw the blood to the brain, and suck up its nutriment to supply the demands made upon it—leaving the rest of the body puny, sickly, and debilitated, the brain of a giant in the body of a dwarf—or else the endeavour to force the mind whilst the body is craving for and seizing upon all the nutritive supplies will entail a break-down of the intellect,

* Are boys taught according to their capacity? Not alone their capacity to receive instruction, but their capability of supplying the demands which the intellectual digestion of that in struction must make upon the material digestive powers of the stomach and its allies? Is anything else thought of at our public schools and colleges, especially at our preparatory institutions, which are places of *cram*, than the ability of the boy to hold such and such an amount of facts? How he will stand the wear and tear that the *mastering* of those facts will entail upon his vital powers, or what sort of constitution the parents have bestowed upon him to meet the demand, is seldom inquired about.

exhibited in an inability to exert the powers of thought beyond the commonest subjects ever after. This will explain the many sad disappointments which prizemen, first-class mèn, high wranglers, &c., cause their friends and the public. It is the attempt to make man an intellectual being *par excellence*; whilst nature demands that he shall be a *digesting* animal, as a *sine quâ non* to every excellence comprised in the term manhood.

The universal sympathy of the digestive organs with all the others demands that no less attention be bestowed upon the latter than upon the former, if we would secure their healthy action. Pure air is as essential to pure blood as is good and wholesome food. Respiration must go on *pari passu* with digestion; and therefore they whose digestive powers are feeble require a good deal of out-door life to assist in elaborating healthy blood. But this is exactly contrary to what usually takes place. If there be a delicate and ailing member of a family, he is generally put to some trade or profession requiring but little muscular exertion, and which is carried on in-doors. No arrangement could be worse. The in-door employment is sure to lead to the greater application of the mental powers, if they be good, and then the body suffers still farther. The mind is to be cultivated; so the brain is taxed, and the digestion must be *forced* to supply the requisite power.

Now, an out-door employment, such as that of a military or naval life, or farming, or surveying, &c., would have brought the digestive powers in such cases up to *par*, and then the mind, but gently taxed at first, would have been fortified, and become capable of an amount of exertion which, in the first years of life, would have ruined both. Thus we often see men who disappoint us in another and more pleasant way. They were dunces at school; so they took to sports, games, out-of-door life, as a necessity of their nature; and in due time the dormant intellect springs forth, and great and heroic actions, or unexpected discoveries or investigations, reward us for our patience and reliance upon nature. But whenever this debility or hereditary degeneracy of the digestive powers is accompanied with a corresponding weakness of the respiratory function; when to a weak and irritable stomach is added a delicate and susceptible chest, more than mere out-door life will be requisite to get rid of the morbid tendency. Here it is that *where* to live becomes a question as important as *how* to live. The utmost circumspection is required in fixing upon a climate, mode of life, and profession for persons who have inherited this double weakness.

Unfortunately, the climate of these islands is not a good one for persons with both a consumptive and a dyspeptic diathesis. The weak digestive powers require that the invalid should *pass* a good part of each day in the open air, and

this will not always agree with the irritable mucous membrane of the lungs. A free, *dry*, and moderately warm air is what is required; the first two on account of the stomach, the last on account of the tender lungs. Nothing in the progress of modern pathology is more striking than the tracing of constitutional disorders up through their pabulum — unhealthy blood — to their fountain and source—imperfect and deranged digestion and assimilation of food. Cold and damp weather, and *à fortiori* cold and damp climates, are especially obnoxious to that form of consumption which appears to have its origin in impaired digestive powers; and of which scrofula, marasmus, and water in the head are the homologues in children.

The manner in which cold, and especially moisture, operate in depressing the digestive functions is subject of dispute. Whilst some attribute their effects to their depressing action upon the general nervous system, others believe that it is by checking the secretion of the skin that cold and moisture derange the assimilating powers. There can be little question that both views are correct, though partial. A fresh dry air, in addition to being in a higher positive electrical condition, stings and excites the nerves of the skin, which again excite the capillaries to increased secretion; and by means of the cutaneous exhalation thereby excited, a good deal of effete matter is thrown off, and room made for

the reception of new substance. So long as these actions can be maintained in proper vigour, so long healthy digestion will be insured; and those deposits of morbid matter from a crude and ill-elaborated blood which fall upon the lungs and the lymphatic and mesenteric glands in the form of tubercle or scrofula, or upon the joints as white swelling, or upon the brain as tubercle and hydrocephalus, will be averted or removed.

At the same time, no function is so much under the influence of mental impressions as the digestion. Therefore the manner in which education and home management are applied will influence the condition of the health, especially of these delicate subjects, in an extraordinary degree. If harshness and moroseness characterise the teacher, the pupil will be depressed; the tone of his nervous system will be lowered; and this will react most unfavourably upon the assimilative powers. Cheerfulness is the best sauce to meat; cheerfulness, and kindness, and sympathy are in like manner the best stimulants to intellectual digestion.

Seeing, then, how universal are the connections and sympathies of the function of digestion with every other operation of the body, there will be but little chance of those who are predisposed by hereditary transmission emerging into a better digestive condition unless precautions are used to place the *whole* system under the best possible hygienic conditions. Therefore, if the invalid

belong to that rank of life which admits of choice of residence, a situation should be sought for where the soil is dry; not only that on which the house stands, but that of the surrounding country; a gravelly or rocky substratum being the best. It should be sheltered from cold winds, particularly the east and north-east; freely exposed to the south; and as warm as the range of climate at command will admit. Many of our sea-side places will occur to the reader as affording most of these requisites; the sea air, although moist, being generally, in winter and spring, warmer and softer than that of inland places, whilst the saline particles prove valuable stimulants to a languid digestion. The south-east coast of England, from Bournemouth to Folkestone, may be cited as the most favourable sea-side residence; and, if inland places be prefered, the driest, although they may not be so warm as others, should always be chosen in preference to moist and low situations. Hence Malvern, which is as yet little used as a winter residence, is, from its dryness, one of the very best inland winter residences in this country; also Clifton, Leamington, Tunbridge Wells, &c.

If the reader enquire, What am I to do to remove the tendency to disorder of the digestive organs from which I continually suffer? it may be replied, Do as here directed for those whose morbid idiosyncracy is hereditary. If the derangement have been brought on by too close confinement to the desk, the counter, or the office, or even the

garret, you must *partially* abandon that confinement, unless you are content to remain an habitual dyspeptic, and perhaps hypochondriac, for ever. No tinkering of the stomach and liver will avail you. If you put them right to-day, they go wrong again to-morrow. You try this and that article of diet; you vary your hours of meals; you try beer, porter, wines strong and light, diluted alcohol, teetotalism, water cures, movement cures, the gastric juice of calves and pigs, galvanism, mineral waters, and a whole pharmacopœia of medicinal remedies, with but temporary and ever-diminishing benefit. And why? Because whilst, like Sysiphus, you keep rolling your heavy stone up hill, some demon forces it back again. Slay the demon; remove the constantly acting cause, and permanent benefit may then be hoped for.

Good digestion, be it understood, depends upon the kind of food put into the stomach in a *very small degree* compared to the condition of that which is to dissolve it—viz., the gastric juice. Everyone must have noticed, almost with horror, the substances which the hardy countryman will put into his stomach. Hard cheese by the pound; hard salt meat; boiled paste, which would serve for a cricket-ball; whole onions by the half-dozen, washed down perhaps with cider so harsh and acrid as would lacerate the tender throat of the delicate citizen. Nay, all who are in the habit of taking an autumn scamper over the Scotch hills, or a walk through the Tyrol, or, more ambitiously, of

climbing the hoary head of Mont Blanc, must have observed, not with horror this time, but with equal wonderment, as in the other case, the enormously increased appetite which now digests with ease things which, in the meridian of London, he would have been thought mad to attempt. The increased purity of the blood supplies a better and a more abundant gastric fluid, and the increased waste of the system under the abundant exercise excites a *genuine* want—vacant places in the system—to be supplied with new material.

If you take but half an hour's *out-door* exercise, and are dyspeptic, take an hour's; if still dyspeptic, take two—if not at once, one hour twice a day. If, with proper attention to diet, you still remain dyspeptic, either your occupation or your residence does not suit you, and you should seek to change them.

But exercise must be proportional to the powers of the system; and only as these increase can it be safely augmented. But there are several kinds of exercise; and when you have considered well what it is, in your individual case, that you wish to effect by exercise, you will be able to choose that kind most easy and suitable to it.

If appetite fail because of the *impossibility* of getting enough fresh, changing air, you must try and get rid of the effete matter from your system in some other way. You will find the skin your greatest ally. You may always stimulate *it* with safety, and so increase the work it does to a very

considerable degree. Daily sponging with tepid or cold water, and prolonged friction, will so excite the vessels of the skin that they will bring there a large part of the effete matter of the system, and so perform some of that labour which your sedentary habits deny to the lungs and kidneys. When the body is unequal to the amount of muscular exertion requisite to preserve the proper temperature of the body during the exercise which *must* be taken to secure appetite and the power of digestion, passive exercise comes to your aid. Gestation of some kind—riding on horseback or in a carriage, sailing, &c.—will give the lungs fresh air, whilst the muscles are nearly at rest. So, if two hours of out-door exercise be for you the smallest allowance compatible with health, and you can only walk for half a one, the remaining hour and a half must be taken passively. Even sitting out in the open air, well clothed, will, in all weathers but the worst, be practicable for a much larger portion of the year than is generally supposed. You sit in an open carriage without taking cold when the temperature, perhaps, does not exceed 45° or 50°; why not in the garden, where you are more sheltered from the wind? Proper clothing is all that is wanted.

Of course, it will be understood that in commending out-of-door exercise, that taken in-doors is not meant to be excluded or condemned. The same principle acts here as there. If a constant *renewal* of the air can be secured, exercise in-

doors, with plenty of muscular exertion, will be the next best thing to that without. But it must ever lack the great advantage of a constant succession of fresh waves of air coming in contact with the surface, whose effects are like those of the waves upon the skin of the bather; each shock appearing to excite an emission of electricity which invigorates and enlivens the whole system.

Next to, but far in arrear of, those influences which act upon the general well-being of the system, and through that upon the stomach, such as pure air, a due amount of muscular exercise, change of the course of thought and attention, freedom from worry and anxiety, and the absence of injurious passions, we place the proper regulation of the diet.

By those who imagine that the stomach is a mere inanimate machine—'a mill, a fermenting vat, or a stew-pan'—the quality and quantity of the food will be looked upon as the only things requiring attention to secure the efficient operation of that organ. But even in this coarse comparison of a most vital and sensitive organ with a piece of dead machinery, it must be recollected that, in order to obtain good work, the machinery must be kept in good order, as well as care taken in selecting the material supplied to its operation. Thus, before we consider what food to put into the stomach, we must ascertain what are the powers of digestion which it at any particular time possesses; also what are the wants of the

system, as indicated by natural hunger; and, thirdly, that all mechanical hindrances to digestion are removed.

Pressure upon the pit of the stomach, so often caused in the sitting position, as over the desk in writing, by which the abdomen is bent upon the chest, and the stomach squeezed against the unyielding diaphragm, has a very injurious effect upon digestion. The shoemaker's malady arises from this cause, as does also some of the gastric miseries of glovers, milliners, and needlewomen. Literary men, in the haste of writing down and fixing their fleeting thoughts, are apt to forget the bent and constrained position of the body; and none suffer from more painful affections of the stomach than do the editor and the professed *litterateur*. The desk should always be at such a height as to necessitate the keeping the spine and shoulders almost perfectly erect whilst writing.

Quantity of food will always be a more primary consideration than *quality*, inasmuch as it will have to depend upon the actual healthful waste of the body by exercise. Nor must the quantity requisite be judged of by the amount of material which is thrown out of the body daily, as it is the fashion at the present day to reckon it. So long as the vital processes of assimilation and waste possess any powers, so long will they struggle to rectify any errors committed in providing fresh supplies. We have a willing slave, who not only consents to keep our house clean, under proper

and normal occupation, but who will do her best to clear up after our numerous evening parties, our jolly suppers, and all the litter and mess made in the house by a constant succession of idle visitors. Therefore, unless we can be sure that we are taking in only what is good for us, it is impossible that we should know what is the amount of waste which would go on in a perfectly normal state of the system.

Our difficulties will be increased when the actual wants of the system and the powers of the digestive organs are not in accord. If, with a feeble stomach and a small supply of gastric juice, we overtax the vital powers by heavy labour either of body or brain, not only are the stomach's difficulties increased, but they are rapidly complicated and perpetuated. It is here that the most fatal errors are committed as regards diet. Knowing and feeling the want, one is tempted to try to supply it by cheating, coaxing, or bullying our good slave, the stomach. Nitrogenous food, in the scientific language of the laboratory, is seized upon as being likely to give us the nourishment we require in a small compass. Hence concentrated soups and rich meat dishes are taken under the idea that they will be easily digested. We do not find it so, however. We find, on the contrary, that the stomach *will* have some of those things which appear to be of little use to the system—only taking up room in the stomach and abstracting some of its juices. Nor,

if we are unduly wasting the tissues of our brain and nervous system, will a diet chiefly of fat and phosphoric acid—the pabulum of nerve and brain—receive any greater toleration from the recalcitrant stomach.

Failing in tempting the stomach by food of high quality, and of so-called easy digestion, we next try coaxing the unwilling organ. A glass of wine is given to it to commence with, and in gratitude we expect a free secretion of gastric juice the moment the meal begins. Should this not occur, we pour in more wine, or take a medley of spices, sauces—condiments—to bribe the stomach to do its duty. If both plans fail, as they often do, then the last resource is had recourse to. The peccant member must be *punished* with drugs—drenched with potions or crammed with pills. It is whipped in this manner until it either turns sullen, and takes no further notice of drugs or of spices, or else pines and wears away under continued ill-treatment and misunderstanding.

In order not to go over the ground twice, I must refer the reader to the third part of this work for rules of diet applicable as well to the preservation as to the restoration of health. It will be found there that that only which can be digested with tolerable ease and rapidity will prove nourishing to the system; and that we must regulate the condition of our food, the quantity taken at one time, and the frequency of meals,

according to definite principles and careful observation of results.

INDIGESTION.—When confirmed indigestion has taken the place of that easy, unfelt disposal of our food which is the privilege only of the healthy, it will demand special consideration, differing somewhat in detail from what has been stated above.

The subject of indigestion has perhaps been treated of by a larger number of writers than almost any other disorder to which our frames are liable; and the modes in which it has been treated are almost as Protean as are the phases of the disorder itself. Hence has arisen so much confusion that most persons give up the matter in despair, and, instead of endeavouring to form any general principles of action, treat every individual case upon what they call 'its merits.'

This is an empiricism which will vary in its *hurtfulness* according to the tact, experience, and judgment of each individual practitioner; and the best will find himself at great disadvantage with an intelligent patient, as regards his dietetic and even his medicinal management.

If it be possible to divest the subject of the obscurity which is caused by the different ways of viewing what is really the same thing, for the benefit of the medical practitioner, it must be doubly desirable to aim at simplicity and precision in presenting it to the general reader. Yet I think it may be so presented to him.

1. ATONY.—First, then, it will be understood

that the stomach, like every other organ, especially muscular ones, may be affected with mere *debility*. Its fibres have lost their tone or tension; they are slack, like the wires of a piano out of tune. This state is correctly called ATONY. It may be either an idiosyncracy, sympathetic of general want of tone or strength of the whole system; or it may be acquired, and restricted to the stomach and intestines only. It is most apt to be induced by too great a strain upon other organs, especially the nervous system. Hard study, long hours of office work, too much walking, too great exertion of the voice, are both predisposing and exciting causes of this form of indigestion. Sometimes it becomes so great as to interfere with, or entirely to put a stop to, digestion; the walls of the stomach having been still further exhausted of their tone by exposure to cold, or to great heat, or to mental shock or strain, or to over-distention with food, or by sympathy with some other ailing organ, particularly the heart.

This is the morbid condition of the stomach which, I think, taking all classes and ages of the community, is most frequently met with. All its symptoms flow from an *imperfect* and a *delayed* process of digestion. Soon after eating there is a sense of fulness and distention which, commencing at the pit of the stomach, propagates itself both upwards towards the chest, oppressing the heart's action, and downwards into the intestines, giving rise to flatulence and uneasiness. After a time

gas is disengaged from the mass of food, which generally rises upwards, carrying with it the flavour of the food, which is by this time acid and very disagreeable. These eructations sometimes produce a hot and burning sensation in the lower part of the throat, and then it is called heart-burn.

The delay of digestion is caused by two circumstances. The first is the deficient supply of gastric juice, which is owing to the want of tone in the nerves and vessels of the stomach; and the second is the relaxation of the walls of the organ, which are unable to pass the mass of food to and fro in that regular churning or worm-like motion which is necessary to bring the whole into contact with the mucous membrane of the stomach.

Now arise other symptoms: *Nausea*, from irritation of the nerves by the undigested food; pain at the pit of the stomach, from the same cause; and headache, coldness of the surface, and of the feet in particular, owing to the sympathy of the brain, the heart, and circulatory vessels, with the oppressed state of the stomach. In many persons the heart's action now becomes irregular and slow; in others, who are more robust, it is quicker and fuller, and there is a peculiar inaptitude of the mind during all the time that this condition remains. After a considerable time—generally much longer than is required in health—the food is passed out of the stomach into the small intestines, and a sense of relief is at once

experienced. Pain and irritation may be set up below by the imperfectly digested mass; but this is seldom the case until the disease has passed from mere *Atony* into the next stage—that of *Morbid Irritation.*

It will be understood that this essential debility of the stomach may vary through a very wide extent. Some persons experience but slight inconvenience, and that only after some little excess at table; whilst with others the contractile powers of the stomach are reduced to so low an ebb, that vomiting is the only relief to the oppressed organ, and little or no nourishment is obtained from the food at all. The strength now rapidly fails, and other complications ensue.

This state of atony of the stomach, or indigestion from weakness, is more frequently produced by causes operating upon the whole system than by mere errors of diet; although, when there is a predisposition to it, these errors will tend greatly to aggravate and perpetuate the complaint. This view is strengthened by the fact that it is generally accompanied by debility and want of tone in other analogous organs. Thus, the bowels are generally sluggish and confined, although the half-digested food will frequently give rise to fits of diarrhœa. The heart's action is feeble, the breath easily hurried, and the muscular power of the limbs diminished; so that the readiness with which patients become fatigued by muscular exercise will often furnish us with the measure of their *digestive powers.*

This simple or primary stage of indigestion will be best prevented or removed by careful attention to the tone of the general system—exercise in the open air, rather long continued than *very* active, being the first and *essential* requisite. But some kind of manual exercise two or three times a day; early hours of rising and going to rest; and, above all, rest or repose during the *first hour* of digestion of the chief meal, which should never be later than five or six o'clock, should not be neglected. If hard work of any kind must be resumed immediately after meals in this condition of the stomach, we need not then hope for much improvement from other appliances. Exposure to cold during digestion is also especially to be avoided.

These are the cases in which cold sponging and frequent friction of the stomach and abdomen prove of the greatest service; they are never to be applied, however, whilst a meal is undigested. A moderate allowance of wine or beer, chiefly the latter, will generally agree with these atonic dyspeptics, but they must never be taken except with, or immediately before, a meal. The meals should be not more frequent than every five or six hours; the food being finely divided, eaten with unusual slowness, and well mixed with saliva in the mouth. It is in these cases that pepsine, the dried gastric juice of the calf or pig, will be found useful. The constipated state of the bowels may be remedied by drinking a glass of cold water two or three hours after a meal, by a little treacle, brown bread,

or, if these fail, by one of the formulæ to be found in the Appendix.

2. MORBID IRRITATION, OR ATONY, WITH IRRITABILITY.—It is rare to meet with an uncomplicated disease of long standing in any part of the body; still more rare to find one form of disorder of the stomach unblended with other symptoms, either pertaining to the same, or to distant organs. The universal sympathy between the stomach and all the other organs will sufficiently account for this. It both feels with them in *their* distress, and it takes care to make them participate in its *own* troubles. It is not at all inclined to mourn in silence, and meekly put up with the "wrongs" inflicted upon it; but it makes its lamentations heard by its neighbours far and near, and draws them all in to participate in its quarrels, thus putting force upon the offending owner to compel him to alter his conduct.

Before the atonic condition of the digestive organs just described has continued very long, other symptoms show themselves, which, for convenience sake, we divide into a separate group, and call the affection by a new name. I believe that that which most correctly describes it, at least for the comprehension of the general reader, is the term *morbid irritation*, or *atonic irritability*. Always, and in every organ, we find *irritability* a close attendant upon *debility*. The weak organ is easily disturbed and thrown into action; but *that action* is like the fretful restlessness of in-

capable childhood or imbecile old age; there is no *power* about it. Repose is the symbol of power, correctly sculptured in the sleeping lion.

When the condition of simple atony, or want of power in the muscular coat of the stomach, has continued for a greater or less time, the symptoms of morbid irritation show themselves. They may be produced by the simple continuance of the causes which induced the primary disorder, the over-distention of a weak organ soon irritating its nerves and vessels. No doubt, one of the chief causes of this second group of symptoms is to be found in continued errors of diet, such as the cheating, coaxing, or forcing plan above alluded to. Things go from bad to worse; as the traveller, who does not pull up at the first perplexity, and try back to make sure of the road, but keeps blundering on, gets further and further from the desired goal, and has to retrace his longer way in pain of body and vexation of mind. The farther along the road to confirmed disease of the stomach the invalid has proceeded, so much more difficult and tedious will he find the path which leads back to health.

When the stomach has become morbidly irritable, the great feature is *intolerance of food.* The patient is well enough so long as he is not called upon to use his stomach, although he suffers from the debility and exhaustion consequent upon the want of nutriment in the system. It is in this case that the greatest circumspection

becomes necessary in regard to diet; as it is also in this case that the greatest benefit is to be derived from its judicious management. Indeed, neither medicine nor hygienic rules will be of much avail unless the diet be regulated in the most rigid manner. If much food be taken at once, there will be pain in the stomach all the while it remains there; and relief is only to be obtained by assisting its passage as speedily as possible into the next portion of the digestive apparatus—the duodenum. The appetite is so uncertain, however, and the symptoms subject to such remarkable remissions, that the dyspeptic is frequently induced to indulge his desire for savoury and highly nutritious food, which almost invariably aggravates the distress. The pain in the stomach comes on from half an hour to two or three hours after taking solid food; whilst liquids, except in small quantities, give rise to an almost equally painful feeling of distention, and to disengagement of large quantities of gas. Should vomiting come on, the symptoms are all relieved, as in the last form of disorder.

The gastric juice supplied in this form of indigestion varies both in quantity and quality. If it is deficient in either, the food speedily runs into incipient putrefaction unless great care be taken to use only such as does not readily pass into that state. Hence the flatulence and ill-tasted eructations, acid, salt, or putrid. Hence heartburn, pyrosis, or water-brash, and all the rest of the

diabolical train of symptoms which make life so miserable; and there is no rest until the stomach has relieved itself of its burden by shifting it on to its next neighbour.

The patient will further be able to verify this type of his disorder by the white furred tongue, generally red at the tip and edges, which indicates the implication of the nervous system in the disorder. The tongue is ten times more the index of the state of the nervous system than of that of the mucous membrane of the stomach; but the white, creamy, clammy mucus adhering to it is a true index of the state of the gastric mucous membrane, where the same condition exists. In Dr. Beaumont's 'Experiments with St. Martin,' he found the same reddened state, patched with white exudation, of the mucous membrane of the stomach, whenever that organ was irritated by indigestible food, or by food taken when not wanted, or by alcoholic drinks, or, especially, by anger and other passions of the mind.

The remedies which the patient has in his own hands to ward off the accession, or to relieve the attack of this form of indigestion, are two—*First*, counter-irritation; and *Secondly*, rigid and judicious diet.

Let him not suppose, by the term counter-irritation, that I intend that he shall commence a series of blistering, mustard plasters, or irritating frictions of any kind. These are for the physician to apply; they can never be used by the patient

without the risk of doing three times as much harm as good. The counter-irritation I allude to is that of withdrawing the excitement from the nerves and vessels of the stomach to other organs which are sure to be unduly torpid. To relieve the determination of blood to the gastric mucous membrane, we must solicit it to other and distant parts of the frame. This is to be done by friction and muscular exercise. Friction, *not over the stomach*, but over all the rest of the body, preceded in the morning by tepid or cold sponging, according as the weather is cold or warm, but used dry at other times of the day, is of the greatest service. It should be continued for as long a time as the patient's strength will admit, from ten minutes to twenty being a fair medium. If the feet are habitually cold, they may be put into mustard and hot water every other night, and kept warm all night by means of a bottle of hot water. I have known indigestion, especially that which follows a meat supper, entirely removed simply by keeping the extremities very warm all night. The contrary state is certain to produce disturbed rest, dreams, nightmare, &c.

Muscular exercise, of which frictions are one form, must be used to the *full extent* which the vital powers will allow, and the greater part of it in the open air. It is here that change of air—that is, *change of scene and work*—is of the greatest service. The excitement of the mind communicates itself to the body, and the work done by the

muscles takes away the concentration of irritation from the coats of the stomach upon the very principle of counter-irritation; viz., that two powerful actions of the same kind do not usually go on in the system at the same time.

Riding on horseback and walking are incomparably the best forms of muscular exercise in this affection. Riding can be adjusted to the degree of vigour with the greatest nicety, and therefore may precede walking as a remedy, although the latter is the best preventative.

Too often both the physician and the patient are disposed to look to errors of diet as, if not the *fons et origo* of this malady, at least the continuing cause of its symptoms. A great mistake is here committed, and one which, if they will recollect how these same dyspeptics *can* eat when out for a month's holiday, they will be at no loss to discover. The cause is almost always to be found in sedentary labour, or in insufficient muscular exertion in an unwholesome atmosphere; and this in all ranks of life. A glance at the dense masses of young persons as they issue from the doors of our manufactories, will strike the observer with a vivid sense of the difference between their pale countenances and flabby muscles, and the rosy cheeks and robust and firm flesh of those who work hard out of doors in the country. The same exhibition is made by the young people confined for too long hours in shops, offices, or counting-houses.

Everything, in fact, shows a want of *tone* in the tissues of the whole body, as well as, in many instances, a chronic poisoning of the blood by breathing the exhalations arising from human bodies, or from other deleterious matters. As the muscles of the limbs become lax and irritable, so do those of the internal organs — of the heart, stomach, and intestines. If, now, in this state of the system, you apply a source of irritation to any organ, and to a very irritable organ in particular, you quickly derange its functions in the exact manner of this form of indigestion. It is annoyed at even its accustomed stimuli, whilst an unaccustomed one becomes at once a source of disorder or disease. This results from the weakness of the vessels or nerves, as a consequence of which congestions more easily occur, and from the slightest causes. Once congestion has taken place in the mucous membrane of the stomach, it tends to perpetuate itself, because it interferes with the proper emission of gastric juice; and so the food, being imperfectly digested, becomes a source of ever-recurring irritation.

Now, it will be seen, I trust, how much larger a share is played by the condition of the stomach— its muscular coat, its vessels, its nerves, and its mucous membrane—than by the mere food which is put into it, in exciting, and especially in continuing, a condition of morbid irritation of that organ.

Nevertheless, it will not be possible to cure the

disorder unless, in addition to the hygienic rules—fresh air, muscular exercise, frictions, bathing, and change of scene—a properly-regulated diet be observed and steadily adhered to.

An error of great magnitude, and one very commonly committed, meets us at the outset. Finding that food generally produces pain or uneasiness, this kind of dyspeptic is disposed to place too long intervals between his meals in order to stave off the discomfort for as long a time as possible. If he be at all actively employed, the craving for food in the system, which makes itself known by a feeling of sinking and exhaustion, will probably induce him to eat too much at one time. By this means the walls of the stomach are put upon the stretch, the nerves are irritated, and the food will not be properly mingled with the gastric juice. In simple *atony* of the stomach, where digestion is merely delayed, a considerable interval may be placed between meals; but in this affection food must be taken oftener, and in very small quantities. The lightest farinaceous substances, with very tender and digestible albuminous foods, formulæ for which will be found in the Appendix, must be used, and, if in very small quantities, they may be repeated as often as the stomach has emptied itself—that is, every three, three and a half, or four hours. Alcoholic stimulants are here *wholly inadmissible* until that part of the disorder, at least, which consists in congestion and irritation, is got under. After this, light dry wines free from sugar

—Moselle, Hock, Claret, and bitter Sherry—in moderate quantity, will be useful in keeping the circulation active through the abdominal vessels.

Wine or beer should never be taken, in this irritable stage of indigestion, on an empty stomach or some time after a meal. In the first case, especially early in the morning, it congests and irritates the mucous membrane, causing a pouring out of gastric juice when there is nothing in the organ for it to act upon. Heartburn and acidity follow this practice, and the next meal is never well digested. The alcohol required should be taken with the *first* portion of the meal—lunch or dinner—and never afterwards, when it only *retards* instead of hastening the digestive process. Tea, the good effects of which in dyspepsia will be hereafter adverted to, is the best beverage here.

The other principal forms of indigestion I designate as—

3rd. Acute Irritation of the Stomach;

4th. Chronic Inflammation of the Stomach; and

5th. Gastralgia of the Stomach (Neuralgia).

These more severe forms of gastric disorder flow out of the former, as organic disease, after a time, takes the place of functional. *They* can only be accurately made out by the attentive physician; they are too complicated and mixed up with disorder of other organs, such as the liver, the small and large intestines, the heart, kidneys, uterus, &c., to make it desirable to enter upon the description of their symptoms in a work like the

present, which is intended to be understood by the lay as well as the medical reader.

Indeed, the ramifications of confirmed indigestion are endless. Symptoms the most unlooked-for, and most remote, in their usual connection, from the function of digestion, are now associated with it. The liver is one of the first organs to suffer, then the duodenum and small bowels, then the heart and lungs; and, at all times, the brain, with the intellectual and moral faculties; these widely-diffused symptoms being the result of that still more widely-extended sympathy which the stomach keeps up with every other vital organ.

Cold and damp feet often give rise to painful spasmodic affections of the stomach, especially in the case of females. They are in the habit of drinking large quantities of weak tea and other slops to relieve these painful affections, by which, although they may be relieved for a time, they are generally rendered more intractable. Undigested articles of food will sometimes remain in the stomach for an astonishing length of time —two or three or more days—exciting great pain and irritation there, and, if frequently repeated, laying the foundation of permanent disease.

Excessive exercise should always be avoided where there is a tendency to neuralgic or spasmodic affections of the stomach, particularly in a gouty habit. If the stomach be greatly exhausted, the gout will be 'thrown out' with more diffi-

culty, and may seize upon the stomach, and through it the heart, and so destroy the patient suddenly.

Twelve General Rules to be followed when there is a tendency to Disorder of the Digestive Apparatus.

1. Give the stomach all the rest you can, consistently with keeping up the due nutrition of the system.

2. Avoid high temperature in dwelling-houses or offices, but secure the proper warmth of the person by means of warm clothing. 60° is a good temperature for sitting-rooms, 55° for bed-rooms.

3. In proportion to the derangement of the functions of the stomach, keep those of the skin active. Best done by morning and evening frictions.

4. Never take alcoholic liquors—beer, wine, or spirits—without a definite aim, and in obedience to experience of their good effects.

5. Make the intervals between the meals to correspond with the *rapidity* of digestion—emptiness of the stomach being indicated by a feeling of faintness and exhaustion on exertion, or by real hunger. Thus the number of meals in a day will vary from two to five or even six.

6. Reduce the amount of work undergone to a proper relation with that of the food taken. If this is impossible, tea and a moderate use of wine or beer will be useful.

7. When the food is long delayed in the

stomach, you may hasten its passage into the bowels by a moderate draught of hot or cold water, or of tea (not coffee).

8. When very little food can be taken at one time, let the last meal of the day be close upon bed-time, and consist of arrowroot, cocoa, a sandwich, or of fish, in order to ward off exhaustion in the night, which debilitates the digestion in the morning.

9. Never eat much when the body is fatigued, nor whilst on a journey, nor during active business.

10. Cultivate sleep on all convenient occasions, unless the body be of a full habit, when a modified and intelligent *Bantingism* should be adopted.

11. Proportion the amount of nitrogenous (better called albuminous) food to the actual exercise of body or of mind which is taken. Carboniferous or vegetable food must be used to satisfy a strong appetite, when otherwise too much albuminous or flesh-making materials would be taken.

12. Cold bathing and sponging will generally supersede the use of aperient medicine; if not, try cold water internally—the cold sitz-bath, or if in tolerably robust health, the gentle shower-bath.

Section II.—The Tendency to Disorder of the Respiratory, Circulatory, and Secreting Organs.

The lungs and the heart are properly considered to rank second in the list of nutritive organs, the stomach demanding the first place. The *first* duty of the lungs is to *complete digestion*, to take in oxygen *mainly* for the purpose of converting the crude fluid sent to them from the stomach into perfect blood; and it is evident that unless properly elaborated material be sent to the lungs and heart from the primary nutritive organs, the stomach and bowels, no action of the former organs can make it fit for the nutrition of the body. *They* take the nutritive fluid as they find it; the lungs adding oxygen, the heart distributing the current to whithersoever it is wanted.

The lay reader, therefore, must not think that we are riding a hobby too hard, when he is asked in most cases when the lungs or heart are affected with chronic disorder, to refer back to the state of the digestion. *There* he will find the little, almost unnoticed, spring whence torrents of pulmonary or cardiac mischief occasionally flow.

Accordingly, I believe I may state that few disorders of the lungs or of the heart are *primary*, that is, arising from causes operating upon themselves alone. Only such as are the result of violence (in which category I include all over-

exertion and subjection to *great* excesses of heat or cold, or to impure atmosphere or passions of the mind) can be said to affect these organs, independently of the condition of the digestion.

Take a case of rheumatism and its consequences —inflammation of the lining membrane of the heart. Never is the disease set up without there having been, for a longer or shorter time past, some disorder in the digestive organs, primary or secondary, by which the peculiar acid matter which circulates in the blood, and inflames the joints, and irritates the muscles, is constantly generated. It is the contact of this morbid material—a true animal poison circulating in the blood—with the delicate lining membranes of the joints or of the heart, which irritates and inflames them. And the same kind of thing which takes place in rheumatism, and in the analogous affection of gout, goes on at *all times* when the digestion of food is imperfectly performed. If ill-elaborated and ill-chosen materials are absorbed into the blood through the fault of the digestion, they will always prove a source—they *cannot help* proving a source—of irritation more or less constant, more or less powerful, to those organs which receive the crude blood straight from the stomach and intestines.

Take one of the commonest so-called disorders of the heart—palpitation—with its attendant dilatation, dependent upon anæmia, or bloodlessness. It is the failure of rich normal blood in the circulation which causes the mischief. The digestive

organs provide only a poor unstimulating fluid, which proves a source of irritation to the heart's substance; for it is a law of the animal economy that the only proper stimulants for any contractile organ is its own contained fluid, in a normal or healthy state—and this irritation, continued over a long period, evidently leads to further mischief, such as disease of the valves and dropsy, or congestion and *angina*, with all its frightful miseries. It is of no use here to give sedatives—camphor, henbane, prussic acid, morphia, foxglove—to allay the excitement and reduce the 'palpitations' to quiescence. The moment the sedatives are withdrawn, the source of irritation being still in operation, all the symptoms return. You must go to the *fons et origo mali*—attack the malady at its source.

See that pale-faced girl, who cannot walk up a short flight of stairs without being almost suffocated with the congestion of the cavities of her weak heart, which feeling of suffocation is caused by the quickening of the circulation resulting from the exercise of lifting her own weight up a few feet of height. She is put upon a regimen of nutritious food, with a little wine or bitter ale, for the purpose of making out of them better blood. If the disease have made any progress, however, there will be no success until the stomach is supplied with a better gastric juice to digest these good viands; and this can only be given by means of iron to improve the blood, and oxygen,

in the shape of out-door life, to amalgamate the iron with the blood. *With* these, a cure is as certain as that of ague by quinine. And so easy is it, that, hereafter, these pale-faced, breathless children, with their sickly beauty, will no longer be brought to the doctor to cure them of their *diseased* (?) hearts. That can well enough be done at home. If we go to the lungs, we shall see the same causes in operation. After long-continued dyspeptic symptoms, mischief commences to be perceived in the respiratory apparatus. The constant tendency of the skin to become chilled, in confirmed indigestion, lays the lungs open to be injuriously affected by changes of air and temperature. They are chronically congested, having to do their own work and that of their ally, the skin, also; for the latter organ will *not* work well if the digestion be impaired.

INFLAMMATION.—Now, let a person in this susceptible condition be subjected to cold or damp, or both, with fatigue or exhaustion to concentrate their action, and inflammation will almost certainly be set up. Inflammation of the lining membrane of the air tubes—bronchitis; or inflammation of the air cells—pneumonia; or of the covering membrane of the whole of the lungs—pleurisy; just as the one or other of these membranes may be the most predisposed, or its vessels in the weakest condition.

What can be simpler than this? Does not the reader see, as the phrase is, wheels within wheels, but *whose apparently* complicated action upon

each other is reduced to the utmost clearness so soon as the clue—the real starting-point—is discovered?

And here, I may remark, lies the secret of the hold which the hosts of charlatans and their quack remedies have upon the public mind. It is that there is a foundation of truth in their averments, however they may travestie or prostitute her to their own vile purposes. They tell the public that, all disorders having their origin in the blood, nothing more is wanted than their wonderful potions or pills, which, by cleansing that fluid of all impurities, will speedily remove every ailment to which the body is subject. *Valeat quantum.*

Upon the same foundation of ill-digested and ill-elaborated material to form the tissues of the body—in plainer language, upon the same impure state of the blood—rests the origin in some cases, the progress in most, of the more terrible form of lung disease—consumption, and of its analogue in the glands of the body—scrofula.

Consumption.—Fifty thousand persons annually die in England of consumption! In the seven years from 1848 to 1854, an average period, 354,542 souls! This English malady, as it is called, surpasses all others in destructiveness, carrying off not less than 12 or 13 of every 100 who die. What is the mortality of the much-dreaded cholera, or typhus, or small-pox, to this? Even including two most violent epidemics of the disease in 1849 and 1854, the total number

destroyed by cholera in the same septennial period was only 83,097, or less than one-fourth; whilst small-pox killed only 36,488 (all of them too many), or about as one case to ten of consumption.

What can be done to lessen the ravages of this Moloch of disease?

All sober-minded physicians are now in accord as to the fact that our sole reliance must be placed in *preventive measures*. Not merely the prevention of the passage of dormant into open and evident mischief in the lungs; but the prevention, whenever possible, of the *predisposing* causes from directing their morbid tendencies towards those organs. Nothing more forcibly illustrates the truth of the observations made in the introductory chapter, as to the nature of disease, than the character of the tubercular or consumptive tendency. We have disease *before* there is any disease, so to speak. We see mischief impending —functions deranged, organs excited or debilitated, the general nutrition of the body failing—before we can detect any actual disease, as marked by change of structure or even of function, in the lungs. But we know that the slayer is creeping stealthily on; we see his toils gradually encircling his victim closer and closer; and before he has touched him with his fell arm, we know that his fate is sealed.

It is useless to take the lungs alone under our protection, and endeavour, by warmth of clothing

or of climate, to shield *them* against attack. By such partial care we shall oftener do harm than good. We may make them more tender, more delicate, and therefore more open to the inroads of tubercle. It is not within my design to cite authorities for the necessarily dogmatic teaching of a popular work; but it may be stated that the more closely the disease is investigated, and the wider the plane of our observation, the more assured do we feel that consumption is a *general disease* of the system, only with certain more tangible manifestations in the lungs than elsewhere.

Consequently, it is to *general* measures that our efforts, whether for preventing or alleviating the disease, are now directed. Change of climate is no longer sought with a view to the state of the lungs alone; the welfare of the whole system must be looked to.

Commensurate with this more philosophical view of the general causation of, apparently, local diseases, is our appreciation of the state of the system which gives origin to them. Debility of the vital organs generally, if not always, precedes the perversion of their function, which is the first *evidence* of disease; consequently, our efforts must be directed to raise the *tone*, by strengthening the *nutrition* of these organs, whilst we endeavour to save them from any improper strain upon them. But exercise is necessary to the proper performance of the functions of *every*

organ, and, therefore, to place any person that has an inherent weakness in any one of them altogether *à l'abri*—under the shelter of inactivity—is the very way to still further reduce its powers and bring about a degeneration of its structure.

The means of preventing the transmission of the consumptive tendency from parent to child is too wide a field to be entered upon here. If people will violate all the teachings of physiology; if they will disregard the warnings of experience; if they will mock at self-restraint when the well-being of society requires it, and study only the temporary gratification of their own passions; nay, if even the testimony of their own senses is not sufficient to convince them of the danger of the quicksands and rocks upon which they are heedlessly rushing, no warning which the physician can give will meet with attention, as no argument which the moralist can adduce will be received with respect. The hereditary transmission of consumption, scrofula, and their allied diseases, by means of marriages between parties affected with or predisposed to them, or between persons of very weak constitutional powers, or differing greatly in age, or too closely allied by blood, is by no means discredited by the fact of healthy offspring occasionally, or even in the majority of instances, resulting from such parentage. We might as well deny the fact of family likeness being the result of hereditary transmission, because *all* the children may not resemble their

parents. We may be sure that they will resemble them more than they will resemble indifferent persons.

So, then, when a tendency to these diseases may fairly be suspected to be inherited, the first symptoms of their approach must be watched for with a keen eye. If the disease be allowed to proceed unchecked but a short distance, we shall never overtake it. We shall be trying to alleviate symptoms at the rear, whilst the invader, who has caused the mischief, is gone on ahead; and so, as we overcome one evil, another will make its appearance.

The only *preventative* of consumption, worthy of the name, is *life in the open air*. Therefore, carry your predisposed children to that place or that part of the world where they can with safety pass the *longest period of the year, and the greatest part of every day, out of doors*—or, what is the nearest equivalent to it—in apartments freely exposed to *fresh* air.

This will not necessarily be found in *hot* climates. They will be more likely to enervate the systems of, at least, the Anglo-Saxon race, and so rivet the chains of the disease all the closer. Before tubercle has formed, a free, fresh, *dry* air is of more consequence than a warm one, on account of its bracing and invigorating qualities. The system must be fortified with a constant accession of new material, and that can only be done by exercise and good diet. Effete and ill-

digested matter accumulating in the blood, if not the immediate cause of tubercle, at least favours its deposition. It irritates the tender structure of the lungs, and, by injuring the tone of their vessels, produces that state of congestion which is the forerunner of a great variety of organic diseases.

Whilst the whole body is thus exercised, and the blood in the lungs duly exposed to fresh air, care must be taken not to subject them to the irritation of very cold or very hot weather, or to very sudden changes of temperature. A respirator should be used whenever the temperature out of doors falls below 45°, and the chest should be protected by additional clothing. In those persons who are already affected, care must be taken to avoid cold night air. Bed-rooms should be ventilated in winter early in the day, and the windows closed whilst the air within is dry. If this cannot be done, a fire should always be lighted to dry and warm the air before the consumptive patient enters the room for the night.

It is most important that the feet and legs be *always* kept warm whenever there is a tendency to lung disease, and all those means by which the surface of the body is rendered less susceptible of atmospheric changes should be diligently used—such as cold or tepid sponging every morning, immediately on rising from bed. The temperature of the water should not fall below 70° in winter, and 60° in summer. The addition of a little

vinegar, or, if a sitz-bath be used, about half an ounce of hydrochloric acid to four gallons of water may be added with advantage. Strong persons may use the shower-bath instead of the above. After the sponging, active exercise (not before breakfast) for an hour will induce complete reaction, unless the vital powers be very low indeed, and then dry friction alone must be used.

In all cases of threatened lung disease, scrofula, marasmus, water in the head, or other evidence of consumptive tendency, the food should be nourishing, plain, and of easy digestion. It is a mistake, however, apparently, to feed such persons upon large quantities of animal food alone; or to give fats, as cod-liver oil, in too large quantity. The due proportion of one part animal to four of vegetable food, bread being included in the latter, should be adhered to as nearly as possible, unless a great deal of exercise be taken, and then the animal food may be somewhat increased. Spirituous liquors and *strong* wines and ales are to be *entirely avoided*, not being free from the danger of keeping up a feverish and impure state of the blood.* Cold water should be the principal drink,

* A difference of opinion exists upon this point; some physicians administering alcohol to consumptive persons very freely. I cannot think, however, that the retention of effete matter in the blood, and the arrest of metamorphosis admittedly occasioned by alcohol, can be otherwise than hurtful, when the primary object is to secure the greatest possible purity of that fluid. In the latter stages of the disease, however, I believe it to be often as

with a little light wine, with the meat. Excessive use of tea and coffee, by arresting the natural waste of the body, is also to be eschewed, particularly in the earliest stages of lung disease.

Whenever a strongly-marked predisposition to consumption has shown itself, it will be advisable

beneficial as in the earlier, or threatening stage, its use is delusive and hurtful.

For a long time there has been a dispute (more on the Continent than in this country), as to the effect of sea-air in consumptive disease. The older physicians used to extol a sea voyage, or the profession of a sailor altogether, in the consumptive tendency. And again, in the present day, it has become the fashion to order incipient consumptives to take a voyage to Australia, the West Indies, &c.; whilst patients in *all* stages of the disease are sent to our southern coasts, not only from all parts of these islands, but from some on the Continent.

The most discriminating physicians, however, those who have devoted the greatest amount of attention to diseases of the lungs, concur in the propriety of electing the kind of climate, &c., for each class of cases, and for each stage of the disorder. The French physicians, who, as a body, object to sea-side residence when the lungs are actually diseased, except it be in the balmy air of the Italian shores, or of Madeira or Algiers, are quite agreed with those of this country in recommending it as a preventative when the disease is only threatening. *Then*, the saline impregnation of the marine atmosphere stimulates and excites a more vigorous exercise of the lungs and skin; and, by conducing to appetite and improved digestion, is eminently beneficial. In scrofulous cases, the preventive agency of marine atmosphere is still more marked; and even when far advanced, a notable and rapid improvement almost immediately takes place in them. This may any day be witnessed by a visit to the sea-bathing establishments on our own coast, as that at Margate; or to the corresponding institution at Böerk, near Boulogne, on the other side of the Channel.

to select such a residence for the invalid as will save the lungs from over-stimulation, whilst it braces the general system, and gives tone to the rest of the organs. This, I believe, will be the most certainly found on a dry and moderately warm situation—on the sea coast, if possible—and one sheltered from high winds of every kind, particularly those from the land. Our own southern and south-eastern coast, from Torquay to Hastings, will furnish us with almost all that we require for at least eight months out of the twelve; the other four being spent either in the shelter of a town, or in a more southern climate.

In cases where the tendency is but *slight*, and the general health robust, possibly a sea voyage, or even a seafaring life for a few years, may dissipate the little hold which the affection has taken of the system; and these cases alone, as far as I am able to judge, are suited for the severe trials of an actual life on the ocean.

When consumptive disease is fully established, residence must be chosen upon the circumstances of each individual case; no general rules can therefore be here laid down for the guidance of the actually diseased.

Asthma.—Asthma is a complaint of such varied character, involving or associating itself with such a variety of morbid states of the heart and lungs, that no rule as to residence can be given without having respect to the peculiarities of each individual sufferer from this terrible disease. Some

asthmatics demand a soft mild air, with a large degree of moisture, whilst others can only breathe in elevated situations, where the winds blow fresh and free every day of the year. Others, again, are so changeable in their habit in this respect, that they are obliged to be always shifting their residence from place to place; that which exactly agreed with them last year being, in this, altogether insufferable. In all cases, however, asthmatics require a *pure* air; one loaded with exhalations of every kind being peculiarly obnoxious to their feelings. They should also be protected and provided against sudden changes in the atmosphere, whether of temperature or of pressure.

PRECAUTIONS TO BE OBSERVED BY THOSE WHO HAVE ANY TENDENCY TO DISEASE OF THE RESPIRATORY, CIRCULATORY, OR SECRETING ORGANS.

1. *As regards the Digestive Functions.*—The food should always be plain, nourishing, in small bulk, and such as will not readily cause acidity or flatulence. The amount of nitrogenous (animal) food may be a little in excess of the carboniferous (vegetable), in relative amount—1 to 3. A sufficient time— four to five hours—must be allowed for the complete digestion of one meal before another is taken, otherwise distention of the stomach and oppression of the lungs or heart will result.

The quantity of drink should be moderate,

and artificial thirst guarded against by avoiding salt meats, &c. Beverages of any kind which *generate* acidity, not *contain* it, must be eschewed.

As a general rule, no food should be taken nearer than three hours to the time of retiring to rest.

2. *As regards Temperature.*—Young persons predisposed to chest affections should be cautiously habituated to going into the open air without hat or bonnet, and leave the throat but slightly covered, or, in men with a beard, without any other covering at all.

Sudden changes of temperature, in the *same day*, or night, are to be guarded against by the use of sufficiently warm underclothing at all times; extras being furnished by cloaks and coats. Merely cold air need not be avoided; but cold with great moisture, especially late in the day, is very hurtful —also east winds. The amount of moisture in the atmosphere most agreeable to different persons will vary to a considerable extent. Irritation of the bronchial membrane, with dry cough, and a tight dry skin, will be benefited by a rather moist, warm air; whilst the opposite condition requires a more open situation, and cool and bracing air. The spring is the season when the greatest precautions must be taken, the body being then relaxed by the coddling which invalids generally give themselves in winter. Remember the old Scotch warning, 'Till May is oot, ne'er cast (leave off) a cloot.'

3. *As regards Exercise, &c.*—When any inherent weakness of the heart exists, it must be strengthened by exercise, like any other muscle. The same is the case in the debility which follows illness, excess, residence in hot climates, &c. Gentle but *prolonged* exercise in the open air is the best tonic to the heart's power, combined with suitable diet. Violent exercises, games, &c., are to be avoided until a large degree of tone has been acquired. The breathing must never be hurried by rapidly ascending a hill, nor by active exercise during digestion.

The foundation of many lung diseases is laid in the first weeks of infancy, by bad management in clothing or feeding. When the lungs are contracted, as in pigeon-breasted persons, those exercises which expand the chest must be sedulously used. Such are skipping, the pole and ropes, rowing, gardening, &c.

4. *As regards the Secretions.*—Whenever one secreting organ is defective, if it cannot readily be restored, take especial care to keep the rest in good working order. Thus, if there be mischief in the kidney, clothe the skin more warmly, and by warm baths, frictions, &c., keep it in vigorous action. The same is to be done as between the lungs and the skin. The secretions cannot be long preserved in a healthy condition unless the digestive organs be kept in good order.

Section III.—The Tendency to Disorder of the Nervous System.

To mention even the names of all the aberrations from the normal condition of the nervous system, and their relations with each other, would require more space than I have at command for this whole section; whilst to enumerate the characteristic features of each, and apply the remedy for their correction, would require a volume.

The nervous system differs from all the others in the one great faculty of entering into relation with the whole of the external world; not only being affected by its own proper stimuli—those things which operate upon the external senses—but by the internal sense, the powers of thought, emotion, and volition, which are a perfect microcosm, a kind of spiritual frame,—an *eidos*,—which pervades, regulates, and commands the rest of the vital machinery.

The brain and spinal marrow may be compared to the great offices and officers of government. This metropolis of the body consists of several distinct offices, where affairs of different kinds are transacted; but they are all so connected together that the presiding officer of each can instantly communicate with the rest, collect their several opinions, sift their varied intelligence, and combine the energy of all into one great act of volition. From this great State machine, the spinal chord, with its nerves ramifying to the

remotest corners of the body, carries messages to all the vital organs, modifying their operations, and co-ordinating the muscles in combined efforts as the central will may dictate. Whilst messengers are every moment departing from the centre of government, an equal number are returning laden with sensations (the information of the nerves), which they have collected in the remote provinces, to be deposited at the seat of intelligence and power. And this unbounded activity never ceases by day, nor, entirely, by night; for impressions made upon the sleeping body are carried to the sensorium, where some one is always waking all night to act upon emergency.

Such being the universality of the empire of the nervous system, who will wonder at the Protean forms of *nervousness*—meaning by that term some kind of derangement of this most intricate machinery? Amid the wear and tear of civilised life,—the hurry and worry of business, the excitement of ambition, the depression of disappointment, the unsteady march of too sanguine hope, or the dead-lock of grief and despair,—what floods, whirlpools, backward eddies and cataracts are not encountered in passing along the stream of life! Where will the current be found to run smoothly, the incline towards the sea of eternity so gentle as to be imperceptible?

NERVOUSNESS is the illegitimate child of civilisation, begotten by ill-regulated passion upon the body of unrestrained luxury. It is a legacy of

our fathers, invested in our constitutions, and continually augmented by our own follies. It is therefore both hereditary and fixed, acquired and changeable. It may affect the mind *or* the body, or the mind *and* the body, at the same time; each separately, or one through the other.

In what does it consist? What is its essence? Its range must be vast when it can be cured with a dose of sal-volatile in the one case, whilst it crumbles away the whole frame, body and mind, unchecked by human skill, in another. Its forms must be infinite, since the changes to be rung upon only ten bells are counted by thousands, the tunes to be played upon fifty keys by myriads, the chords of the nervous expansion being themselves uncountable.

The day labourer, plying his brawny muscles with the plough or the spade, the hod or the trowel, is not troubled with nervousness; nor is the hardy dairymaid and household drudge of the farmhouse. But it haunts the circles of fashionable life and monied ease, where the ennui caused by the want of *occupation* is attempted to be removed by laborious dissipation; it is found in the cabinets of statesmen, where overweening ambition excites a constant turmoil in the brain, and banishes nature's best restorer — sleep. It dwells in the merchant's counting-house, where the overstrained mental faculties contend amid anxiety and foul air to outrun all opponents. It is equally to be found secretly crouching by the

desk of the intellectual pioneer, who, by the murky glimmer of the midnight lamp, coins his brain into words which burn their way into the souls of men, and thoughts that live for ever.

Those vital forces, which are infused into the germ by the parent, and grow and develope with the bodily organs and mental powers, although an unknown, are not an illimitable quantity. If they are drawn upon too much in early life, every function will suffer for the undue abstraction of force ever after; whilst, if their constructing energies are all diverted towards the mental processes, the organs of the body will suffer irretrievable injury.

Remember, also, that where nervous debility is inherited, although matters may be much improved by judicious training, and by a strengthening regimen in youth, the *tendency* remains; and at no time will such a person bear to have his faculties put too much on the stretch, or his mind overburdened with continued anxiety and care. The weak organ must be spared; and out-of-door employments, where little sustained attention is necessary, should be sought for those of inferior mental or nervous energy.

Irritability, which is the essence of nervousness, whether corporeal or mental, results from *debility*. They are two wheels in the economy always acting upon each other. Irritability leads to excitement and fatigue, which again react upon the organs, and increase their debility. The correction of

this state will require constant attention to *all* the hygienic rules; for it argues a want of tone in every organ of the body. The more nearly you can place an irritable, nervous person in a normal state as to the surrounding elements—temperature, light, air, food, exercise—the more you will enable him to outlive or outgrow his fatal tendency.

And other appliances come to our aid. The application of cold is one of the strongest tonic remedies for nervous debility. But it must not be used merely as a change, or in an interrupted and irregular manner—because cold is not wanted in this case as a *stimulant*, but as a tonic. Cold sponging the body daily (with the shower-bath in summer), and active friction of the skin, will do more than anything else to remove the feverish heat or the moist relaxation of the skin, one or other of which always accompanies nervous debility. At least two hours a day should be spent in walking exercise; or, if that be impossible, as much manual labour in the open air as is equivalent to it. Gardening—real *work*—is one of the best resources during a fit of nervous irritation, as it is one of the best preventatives of that state.

It would be trite to say that no more mental work must be done than the faculties will bear with ease. These are not the days when such a simple direction is likely to be carried out. But, at any rate, do not fall into the error of supposing that, because your in-door and sedentary labour is too great, you must take a superabundance of

out-door exertion to counterbalance it. This will indeed be burning the candle at both ends; driving the mill both by water and steam. The muscular labour essential to the health of the brain worker must be deducted *somehow* from the amount of his intellectual work, otherwise the vital powers will be constantly drawn upon; for change of occupation, though pleasant, does not give that rest to the whole vital force which is required.

Persons suffering from nervous debility should live upon plain albuminous food, with a moderate allowance of fat to supply the waste of nerve substance. Their digestion should be kept in good order by regularity in regard to meals—never eating between them—and drinking nothing stronger than water except with meals, and then only light wines or mild beer in small quantities. The more such a person will accustom himself to do without stimulants of any kind, the more satisfied he will be with his progress. There are few cases requiring more than *two* glasses of wine, or a pint of beer or porter, daily. A glass of cold water, taken about an hour and a half or two hours after a meal, will be found an excellent tonic to the stomach in these cases.

In its manifestations in the *bodily* organs, disordered nerve function exhibits itself in three ways—viz.:

1. Increase of local nervous action;
2. Decrease of local nervous action; and
3. Perversion of nervous action.

The first of these conditions is illustrated in the various kinds of fits, convulsions, St. Vitus's dance, &c., to which children are especially liable; in epilepsy and hysteria, affecting grown-up persons; and in morbid irritation, pain, &c. of some organ or part of the body.

The second condition—viz., diminished nerve force—is exhibited in paralysis, partial or complete, of some of the limbs or organs; amaurosis, or nervous blindness; nervous deafness, and in diminution of any other of the external senses.

The nervous action is *perverted* in many painful and anomalous sensations arising from disorder of the central nervous system—the brain and spinal chord—in diseased condition of the internal organs, causing cramps, spasms, convulsion, &c.; or by some poisonous substance circulating in the blood, which irritates the nerves to which it is applied. Many of these poisons—that of lead, for instance—have an elective affinity for certain organs, at which, probably, the system endeavours to get rid of them.

All that the general reader can be expected to do for himself, either by way of prevention or mitigation of the severer degrees of disordered nerve force, is to keep his general health in the best possible order; sparing the weak organ, whichever it may be; observing strict temperance; cultivating a cheerful and hopeful frame of mind; and taking care that there is nothing in or near his residence of an insalubrious nature.

Section IV.—Tendency to Disorder of the Muscular System.

Debility of the muscular system, if not inherited, may be readily produced by inactivity, insufficient food, or too rich and oily a diet. Young persons are not likely to be deficient in activity if the opportunity be afforded them; and the present arrangements of manufacturing and industrial establishments are answerable for the greater portion of the weakly, undersized, and incapable specimens of humanity. Too long hours of work, *at one stretch*, enfeeble the tender muscles of children and youths; and before the time for relaxation arrives, they are too fatigued to reap advantage from it.

Insufficient exercise, conjoined with too nutritious a diet, is a fruitful, I may say a *never-failing cause* of muscular degeneration and debility. The ill-elaborated and super-fatty material taken into the blood is ill suited to nourish the muscular organs; and fat becomes deposited in their substance, dividing the true flesh cells from each other, and so rendering the muscles brittle and inelastic, and incapable of sustained effort. When this condition has taken place in the muscular substance of the *heart*, it leads to extreme debility, breathlessness upon the least exertion, and renders life uncertain to the last degree. When such a state of things has been induced, the sufferer must follow most rigidly the rules of

hygiene laid down by a careful practitioner, if he would hope to check the progress of this insidious and fatal degeneration.

But no system responds to the appropriate stimulus of its organs more readily than the muscular. Unless it has become incurably debilitated by that species of fatty degeneration to which allusion has just been made, judiciously chosen exercise will, in almost every case, recover the tone of the muscles when lost by disease or from inactivity. Muscular atrophy must be remedied by a nutritious diet, consisting of a large proportion of albuminous food, chiefly animal, and by horse exercise, succeeded by walking as the strength increases, and fresh air, exactly proportional to the strength of the individual. Frictions with the flesh-brush are here of great service, for by drawing the blood to the surface, the muscles below will come in for a larger share. When exercise cannot be procured out of doors in sufficient quantity, we must have recourse to the dumb-bells, the skipping-rope, dancing, and 'calisthenics,' and any other kind of bodily movement whereby the muscles will be exercised whilst the mind is amused. There are machines by which almost every kind of manual exercise may be gone through in the house, such as rowing, climbing, sawing wood, &c.; and although they are vastly inferior to the 'real thing' carried on in the open air, they are no bad substitutes for the use of those whom circumstances compel to remain in-doors.

PART II.

MANAGEMENT OF THE SICK ROOM.

CHAPTER I.

THE SICK ROOM.

THERE is a saying, that 'he who is his own doctor has a fool for a patient; but the man who has a good nurse in a wife, possesses two most excellent things in one.' There needs no argument to prove the truth of another saying—viz. that 'good nursing of the sick is half the cure.' Indeed the observations which have occupied the greater portion of the First Part of this work are intended to convince the reader that *judicious management* of illness is at least one-half the physician's art, and the whole of that of the nurse.

If the old-fashioned popular notions of what constitutes disease were, indeed, to be depended upon, the proper thing to do on the access of any disorder would be to send to the doctor for a pill or a potion which would have the effect of

driving the invaders, like a rat from a hole, out of the body by means of some evacuation—vomiting, purging, sweating, bleeding, &c.—*then* nursing would fall to a very secondary position indeed. The nurse would have little else to do than to sit and watch the contest between physic and disease, as one stands by watching for the moment when the ferret shall make the rat bolt from his hole, or as the poor dupe of former times watched for the working of the witch's charm, or the necromancer's philter.

But *now* we know that NATURE is to be placed in the van of the battle; that it is her active forces which, like a solid phalanx of infantry, are to do the real work. They are to cleanse the system of whatever perilous stuff has entered it, poisoning the sources of health and life. It is her corrective operations which are to restore morbid functions to their normal course, whilst the physician leads his contingent of light horse, to strengthen a weak point, arouse the torpid, calm the irritable, and generally to keep the whole co-operating forces in proper order and relation. Like a good driver, he will not allow one willing animal to be doing all the work whilst the rest of the team are idle.

But nature by no means despises our aid. Beyond the elementary assistance here described, she will feel obliged by our becoming her forager and commissary-general. She wants supplies; she may have been deprived of proper supplies

for a long time past; or such as she desires may have been withheld, whilst improper and unavailable material may have been thrust upon her. Again, some of her forces may have been overtried, whilst others have been compelled to an enforced inactivity. From causes such as these it is that disease arises; and without the physician's aid, nature is unable to rectify the mischief which has been done. To remove obstruction from before her forces, to counteract the effects of some vicious process, to assist some labouring organ—this is the work of the physician. Nature is crying out for *help*, not for careless apathy; still less for ignorant opposition.

In the second rank, then, comes GOOD NURSING. Whilst the physician is applying those more recondite means which long ages of observation and enquiry have put into his hands, the nurse has to see that the ordinary household management of the patient shall be such as common experience shows to be favourable to nature's curative operations, whilst it is also made to assist the objects of the physician.

One part of nursing, then, will be nearly allied to the physician's art, and should be dictated by him; the other will depend upon a knowledge of the laws of health, and of those appliances which experience has shown to tend to the comfort and the consolation of the sick.

As a physician, I may perhaps be expected to enter at length into both of these branches of the

art of nursing, and to some extent I intend to do so; but as actual disease will *always* require the skill of the medical attendant to meet its proper and primary phenomena, so should he always dictate the outline of that part of the nurse's management which is immediately connected with his own. I shall therefore say no more upon the medical aspect of nursing than what ought to be possessed by everyone who undertakes the care of a sick person, in order that she may always aid, and sometimes supplement, the exertions of the physician.

But upon that kind of nursing which every case of illness demands, in order that the patient may pass through his ordeal CITO, TUTO, ET JUCUNDÉ—that is to say, as quickly, safely, and pleasantly as the circumstances will admit of—I shall not scruple to occupy the reader's time at a length somewhat commensurate with its importance.

SECTION I.—MANAGEMENT OF THE SICK ROOM.

'I don't feel very well, but I shall try and shake it off; perhaps a good stiff walk will do me good, or I can take a drive into the country.'

Badly reasoned, and injudiciously resolved. Almost all illness is accompanied with a depressed state of some or all of the vital powers, and it is not increased activity which can shake it off. There is one exception, perhaps—viz. that of a common

cold—the excitement of exercise and the perspiration caused thereby being calculated to prevent those congestions of the internal organs which are often the consequence of exposure to cold.

SUDDEN ILLNESS.—Every sudden feeling of illness by a person previously in good health should be treated as of importance, and its signs by no means undervalued. The feeling of languor, weariness, loss of appetite, thickness of intellect, and general depression of the whole system, coming suddenly upon one whose health is generally good, and continuing for *more than twenty-four hours*, should at once be yielded to. Here is either some noxious agent which has got into the blood—perhaps the seeds of some epidemic or contagious disease—or else the body has been exposed to sudden vicissitudes of temperature, or to foul air, or to some other perversion of the natural stimuli to life. If, under these circumstances, you call upon the vital powers for extra exertion whilst they are oppressed by some morbific agent, you increase their exhaustion, and give the attacking power a firmer hold upon its victim. In fact, you exhaust and waste those very forces which are required in all their activity to dislodge the intruder from the system, or to enable the patient to bear up against the debility induced by these abnormal circumstances.

Pay attention, therefore, to all *sudden* attacks of illness. Rest at home; and if the feeling of illness increase, the patient should immediately go to bed.

Active men try to avoid doing this, and laugh him to scorn as a poltroon who takes to his bed for every trifling ailment. It is, however, the best policy, and the quickest way of returning to the duties of life. Many ailments begin with *shivering*. This is particularly the case with inflammatory affections and fevers, especially of the blood diseases, such as small-pox, measles, scarlatina, erysipelas, &c. &c. If this symptom occur after exposure to cold, it is often the forerunner of inflammation of the lungs, of pleurisy, or of acute rheumatism. In all such cases, immediate retirement to bed should be adopted. Merely remaining in bed for one day and night, 'a draw through the sheets for twenty-four hours,' will often cut short a bad cold, if taken at the commencement; and, if assisted by a warm bath, a hot bottle to the feet, and gruel diet, will do more to ward off those attacks of bronchitis, rheumatism, catarrh of the stomach, liver, or intestines, by which it is so often followed, than any other remedy.

It would be needless to detail here the absolute requisites to a sick room, for the purpose of enabling the patient to recover quickly from his illness whilst we secure to him the highest degree of comfort of which his situation will admit, did we not find the principles upon which they should be administered violated, even in the best houses, almost every day. The public are told to secure good ventilation—free access of fresh air to the sick—to remove all foul emanations and secre-

tions; but few authors have condescended to go in detail into the best modes of carrying these recommendations into execution.

Section II.—Temperature of the Apartment.

Nothing but experience, and that of a large number of individuals, taken both singly and collectively, in private practice and in hospital attendance, can enable us to decide what is the most suitable temperature for the sick to be placed in; and even then we shall have to modify any standard we may fix upon in a great number of individual instances, and for various diseases. No one can fix upon a certain point of Fahrenheit's thermometer and say, 'That is the best for the sick room,' unless he has tried it upon a large scale.

In stating, then, that a temperature ranging from 58° to 60° north of Trent, and from 60° to 63° in the southern part of this kingdom, will prove to be the most acceptable to the feelings of the great majority of patients and invalids, I base my statement upon many years' experience both of hospital and of private practice, at the same time that these figures are open to correction for individual cases. In summer a higher temperature will be borne with comfort than will be pleasant in cold weather, when the external air is perhaps at 40°, or below it. When the temperature of an ordinary sitting-room does not

exceed 60°, then 63° will be warm enough for the sick room. There are some special cases in which a higher temperature than this will be advisable; such as inflammation of the respiratory organs or of the intestines and kidneys, acute rheumatism, chronic disease of the heart, pulmonary consumption, tabes mesenterica, or abdominal decline, and, finally, whenever the powers of life are flagging. In these cases 65° or even more will not be found too high.*

On the other hand, a cooler atmosphere is generally necessary in fevers, at least at their commencement, in scarlatina and small-pox, in congestion of the brain and disorders of the nervous system generally, and where there is much delirium. But even in these cases I think we can seldom descend below 55° with safety.

To secure a proper regularity of temperature, a good thermometer must be kept in the sick room, and examined several times a day. It should be placed against an *inner* wall of the room, in the shade—not too near to the patient nor to the fire, nor close to a door or window. The object is to secure a tolerably equable temperature around the sick person; for, however pleasant and desirable may be the daily and seasonable changes of heat and cold to persons *in health*, the debilitated frame of the invalid cannot resist the bad effects of sudden changes.

* The temperature of the wards at the Bromptom Hospital for Consumption is kept, I believe, uniformly at 65°.

This equable temperature is to be maintained by means of fires properly regulated by day and by night in cold weather; and when the nights are cold in warmer weather, then also. This means of creating an artificial temperature will be much better than oppressing the patient with a load of bed-clothing, which can only effect the same object by drawing upon the enfeebled powers of his system. Excess of heat in hot weather is to be prevented by outside blinds, or by blinds of some dark-green or purple material. This is better than closing the window-curtains or the shutters, the almost total exclusion of light by which means gives a melancholy aspect to the sick chamber.

The continued use of fires in the sick chamber tends to dry the air to an excessive degree, and will require to be corrected by some means by which moisture may be thrown into the apartment. When it is desirable to mingle a large quantity of the vapour of water with the air of the room, as in cases of bronchitis, irritation of the stomach or intestines, erysipelas, fevers, &c., the object will be best attained, in cold weather, by fastening a piece of gas-piping or gutta-percha tubing to the spout of a tea-kettle kept boiling on the fire. The steam may be conducted into any part of the chamber, and be emitted close to the patient if desired. To effect this, lay the pipe on the floor close to the skirting-board, and bring it up two or three feet against a wall, to which it

may be fastened by means of a small staple or hair-pin. In the hot dry weather of summer, the same object may be attained, and the air kept cool as well as moist, by placing two or three hand-basins filled with cold water close to the open windows, so that the air on entering may pass over them; or a calico blind may be moistened with water by means of a large syringe.

There are several objects to be attained by the nurse's attention to the temperature of the sick room. First of all, there is consideration for her own health and feelings. I say *first of all*, because, if the nurse be uncomfortable, she will be tempted to leave her patient too much alone; or else her feelings will not preserve that air of serenity and of kind sympathy with the sufferer which it is desirable they should possess. If a hired nurse, she will be perpetually making excuses to get down to the comforts of the kitchen; whilst if she be a wife or relative, the pleasure of nursing a beloved object will be unnecessarily diminished by bodily discomfort.

In the *second* place, the patient's weakened system will not be called upon to generate so much animal heat in order to preserve the warmth of his body as when the temperature of the air he breathes is low, and so a less amount of bed-clothing, &c. will be required, which will add much to his comfort.

In the *third* place, in a large proportion of disorders, especially those of an acute and critical

nature, much benefit is derived by a moderate perspiration being kept up upon the skin—an operation much assisted by a warm moist atmosphere. Sleep, also, is facilitated by a comfortable temperature. For this reason, instead of allowing the temperature of the room to *fall* during the night, as it often does even to a dangerous degree (I have seen it close upon the freezing point in a room in a gentleman's mansion, where the patient was lying with acute bronchitis!), it will bear to be a little higher than by day, although in summer there will be no harm in allowing it to fall to 55°.

A proper temperature, then, must be preserved, 1st, in order to save the patient's strength; 2nd, to assist in the cure; 3rd, to give comfort to his feelings; and 4th, to gratify the nurse. And if I have given it the first place in the arrangements of the sick room, it is because, of all the matters within the entire control of the nurse, it is the one least properly attended to, and, in the majority of diseases, the one, in my opinion, of prime importance, ventilation *not* excepted.

Section III.—Ventilation.

Next to the proper regulation of the temperature of the sick room—indeed, *pari passu* with it—should go ventilation; that is to say, the supplying the patient with as much fresh, pure air as he requires; *more* is unnecessary.

But here, unfortunately, I have to encounter a hydra more difficult to be overcome than all the ignorances and prejudices by which our grandmothers were possessed on this subject—viz. the hydra, one of whose heads is *pseudo-science*; the other, *conceit*. The new light which has been thrown of late upon the subject of ventilation, discovers but one side of the subject, as usual; and the unthinking, those nurses especially who are wrapt up in a fine mantle of scientific conceit, can see no other phase of it. According to them, the principles of ventilation which are suited to the healthy and strong must be *intensified* in the case of the suffering and the weak! *They* cannot have too much *fresh* air! If the healthy should sleep with open windows, how much more the sick, from whose persons morbid exhalations are rising? And because the diseased lungs can neither respire so much air as when in health, nor suffer the contact of it when cold, stream after stream of fresh—that is, cold—air is to be pressed upon them night and day!

Let there be no mistake. Pure air, as everybody knows, is essential in all cases; in sickness as well as in health. But in a properly-regulated sick room the air may be *pure*, yet be *warm* and *still*. If the room be large, or, if small, not crowded with persons or furniture (turn some of the latter out to enable the room to hold more air), the maintenance of a proper temperature, such as I have indicated in the last section, will

of itself nearly control the ventilation. To prevent your fires from making the room too hot, you *must* admit air; and, in any other than very cold weather, this air will have to come from without.

It is so hard to disabuse the mind of the vulgar of the notion that to be *pure* the air must necessarily be *cold*. The fact is, that *cold* air is chiefly useful in driving, by its density, the hot and contaminated air which has been already breathed over and over again to the top of the chamber, whence only, according to existing arrangements, it can be allowed egress from the apartment.

Removal of Secretions.—But, in reality, that which it is of the highest importance to remove from the neighbourhood of the sick person, as soon as they are produced, are the emanations and secretions from his own body. Not only does the atmosphere of the room become charged with poisonous matter, but everything in contact with and surrounding the patient absorbs the secretions of his skin and lungs; by means of which two great emunctorial organs the principal portion of the effete matter generated in disease is got rid of.

Sponging.—Therefore, let the patient be kept scrupulously clean, by sponging the skin with warm or tepid water *daily*; change his bed garments every day, in some cases even oftener; let the sheets and blankets be changed frequently, and well dried *every day* when the patient is able

to sit up. This is the way, and the only way, of getting rid of that which is a thousand times more injurious to the sick man and to his attendants than a little excess of carbonic acid gas in the air he breathes, or a little increase of the temperature of the room.

I have gone at length into the practical directions for ventilating dwelling-houses in another place; * I shall therefore only refer to them here in so far as they require modification for a chamber in whch a sick person remains day and night.

In the forenoon of every day, when the patient has been refreshed by sleep and food, and, if his strength will allow it, by washing and the other personal proprieties, whilst the temperature of the room is not less than 60°, set open the door of the apartment and admit air from the staircase or some other empty room, at the same time that you open the window farthest from the sick bed, at top, to admit of a current freely passing through and through the apartment. In cold weather, there should be a good fire burning whilst this change of air takes place. It will burn up a good deal of the heavy animal matter which the draught will carry towards the chimney. So soon as the air of the room has become entirely changed—which will be known by a fresh feeling in every part of it—and if the thermometer sinks from the egress of cold air, close the windows, leaving, if you like, the door open a little longer.

* 'The Seven Sources of Health.' London, 1864.

If the weather be severe, or the external air very damp and cold, so that the window of the apartment cannot be opened *that day*, ventilation must be effected by means of the door and fire *alone*. You must not risk the patient taking damage from cold damp air, for the sake of one day's closeness in that of his room. Sponge his skin all the more, that you may keep *one* excreting organ in full operation. In *warm* weather, it will of course be necessary to open windows more freely, otherwise the temperature of the room will rise too high.

It will thus be found, in practice, that the thermometer will be almost as complete a guide to the ventilation as it is to the temperature of the apartment. You cannot keep the instrument marking from 60° to 65°, *in all seasons*, without a constant recourse to fires on the one hand, and open windows on the other. But by studying the motions of this little instrument, you will know when the external cold air is entering too freely, or is not sufficiently warmed by a fire, and when the atmosphere of the room is becoming loaded with heated and noxious exhalations.

It is during this matutinal purification of the invalid's bedchamber that he should leave the room, if he be able, and go to another—his day room—ready prepared for him. This is more particularly advisable where several patients inhabit the same room or ward, as in schools, hospitals, &c. If unable to leave his room, the airing

should be always effected before he leaves his bed.

PURIFICATION OF BEDDING.—Whilst the patient is absent from the bed upon which he has slept, take his linen and the sheets, *daily*, and the blankets every *three* days, to a good fire in winter, or to the open air in summer, and dry them well. Every month or so, in those cases where a patient is confined to his room, or is otherwise an invalid, the bed itself, and the mattresses, must be taken down and beaten, dried, and brushed in the open air, or before a large fire.

Always replace the blankets and linen on the bed in a warm state. They will then feel comfortable to the invalid when he returns to them at night.

It will be seen that these observations apply chiefly to nursing in private houses, and in families which have such comforts and appliances as are here described within their reach. But even in the dwellings of the poor, nearly equal advantages may be gained by industry, attention, and good sense. A bit of fire, if ever so small, may generally be afforded in the poor man's sick room in bad weather; and ventilation and personal cleanliness, such as I have recommended for the more comfortable classes, may be secured by a moderate exercise of the three qualities just named.

They are trite enough, perhaps, these rules; as were also those admirable ones given by Miss Nightingale in her 'Notes on Nursing;' and yet

how many thousands, even of the 'educated' classes, did her graphic pen convict of ignorance, inattention, or idleness! And if she drew a somewhat overcoloured picture of the evils of the neglect of proper management in the sick chamber, and attributed something more, perhaps, than is generally attainable to the practice of good nursing, and erred, as others have done, by committing herself to heresies in regard of the origin and propagation of specific diseases, she may well be forgiven her enthusiasm, having witnessed the horrors which surrounded thousands of poor suffering and dying wretches for want of these few common-sense regulations. All honour to enthusiasm in a *good* cause!—its errors will ever stand excused by the well-wishers of humanity.

Section IV.—Light.

In another work I have thought it necessary to pass some rather severe strictures upon the practice of excluding the light of day from common dwelling-houses. To see all the blinds of a house drawn down because a few rays of a watery sun are struggling to pierce through the murky gloom of the dingy sitting-rooms of our town houses, gives us but a pitiful notion either of the common sense or of the healthy feelings of their inhabitants. Light, in these latitudes, is *never* excessive; we cannot possibly obtain more of it than is requisite for the healthy development of the frames

of our children, and for the proper assimilation of air and food—for this seems to be its principal effect upon the animal frame. If proof were needed of the action of light upon the organism, we should find it in the fact that where there is the greatest deprivation of it, there we find deformity and idiotcy most frequent—mal-development of mind and body. The cretins of the Swiss valleys, and the half-idiotic denizens of the dark courts and cellars of our large towns, owe their half-unhumanised condition to this exclusion of the light of heaven.

Look at the rosy cheeks and firm limbs of the children of the poor in country villages. To what, think you, do they owe their healthy colour and hardy frames? To better food than the children in towns can obtain? Better clothing? More careful washing? Their food certainly is of the plainest and scantiest; their clothing none of the warmest; and as to the washing, the skins of the little urchins are not patterns of purity.

No, it is light!—the constant exposure to the full light of day, out of doors—which paints their cheeks with nature's vermillion, and gives firmness to their legs and arms. They are *unbleached*; and we know what bleaching does for inanimate materials, such as cotton and linen: it takes the strength out of them, as it also takes the *tone* out of the little white-faced human fabrics of our large towns.

LIGHT NECESSARY TO RESTORATION OF HEALTH.

—Now, the recovery from sickness, especially of the chronic kind, is, to a great extent, a *restorative* process; a process of building up the body again after it has been shattered and disintegrated by the onslaughts of disease. If this were not so, there would be no recovery from disease at all; the destructive process would go on until the functions could no longer maintain the life of the organs of the body, and death would be the inevitable finish. Light, therefore, is essential to the proper assimilation of new material, whether that material be destined to the growth of the youthful frame, or to furnish the daily and hourly change of substance which the adult body undergoes; as it is also to that process of *renovation* by which the decay caused by injury or disease is remedied and repaired.

But what do we see, nine times out of ten, on entering the chamber of the sick? The curtains drawn closely round three sides of the bed; the window-blinds and curtains drawn; perhaps even the shutters closed. The whole room looks more like the chamber of death than that of the living.

Cheerfulness is said to be the best physician. But who can be cheerful in a room like this, where everything is ordered to remind the sick person that he is as far from his ordinary occupations and feelings as possible, and to suggest to his enfeebled mind the proximity of the sick chamber to the grave!

WHEN TO BE EXCLUDED.—In the commencement

of severe illness, indeed, when the heavy head throbs, and the languid limbs lie inert on the bed, their owner apathetic and careless of recovery by reason of the poison which oppresses his brain, it is proper to soften the light so as not to excite irritation upon the nerve of vision. Also, when the brain or nervous system is affected, or the eyes inflamed, and there is intolerance of light, the room should wear a sombre or shady appearance. But in all other cases the fair diffused light of day should be freely admitted.

During convalescence, it is of the first importance, for reasons stated above, to admit full daylight, and even the direct rays of the sun, into the apartments occupied by invalids. And for this reason it is well, whenever it can be done, to allot *two* rooms to an invalid who is able to sit up for a part of the day, so as to give him the healthy stimulus of change of scene both within the apartment, and of the view without.

It is certain that not only do the public throw away a great *restorative agent* by thus excluding the light from the sick room, but even medical men themselves are too remiss in enforcing practically what they cannot but know theoretically to be desirable for the benefit of their patients. If it be objected that the play of strong light throws up in too strong relief the vivid colours and hideous patterns of the curtains and paperhangings of our bedrooms, I can only answer that such abominations should never have been placed

there; and if you have a room with a plain white paper, or one of some delicate neutral tint, by all means put your invalid into that room at the first onset of his illness.

The process of convalescence is analogous to that of growth. In both cases fresh supplies are needed—in the last, to enlarge the actual area of the body; in the former, to replace that large quantity of effete or worn-out material which nature has got rid of in the processes of disease.

It is on account of this strict analogy existing between the growing and the convalescent person, that the application of these essential stimuli to growth is insisted upon in the case of the recovery from disease. We are aware of the prime importance of warmth for the young to maintain their vital action in proper activity; also of fresh air, and of plenty of light. So disease is much more difficult to be treated in the dark noisome dwellings in the courts and alleys of large towns, than in country cottages where the light can enter freely, and convalescence is slower and recovery less perfect.*

But some one may make the objection that

* Some curious experiments made by the late ingenious Dr. Boswell Reid, the ventilator of the House of Commons, illustrate this fact in a remarkable manner. He found that, after inhaling a variety of poisonous gases and vapours, he recovered from their effects in much less time when exposed to the full light of the sun, than when he remained within doors in the shade.

sickness being the opposite of health, it is not logical to apply the same conditions of the surrounding media to the body oppressed with disease, as we ought to do to one in the possession of normal vigour. We should endeavour to protect the weakened frame, it may be said, against the too powerful stimulus of air, heat, light, or other ordinary vital agents, just as we withhold from the sick man the full allowance of food which he consumed whilst in health.

But disease and health are not *necessarily* so antagonistic of each other as is generally supposed. They are not, like the principles of good and evil, eternally at war with each other, and incapable, by their very nature, of coalescing their forces for the good of mankind. In every case of disease, except those which speedily terminate in death, and sometimes even in *them*, there are *some* healthy processes going on, struggling to assist the whole system in regaining the path out of which it has wandered.

So that it is to the functions which *remain in health* that we must look for the power to remove disease, and to restore the system to its normal operation after that has been accomplished. To do this, nature will require her usual way—her indispensable armaments. Food, air, light, heat, must be obtained, not perhaps quite to the same extent as in health, but in such proportions as shall stimulate the vital powers to *increased* action, and maintain them so against *the depressing* influences of disease.

Section V.—Aspect of the Sick Room.

The temperature, light, and ventilation of the sick room having been provided for, its aspect and look-out deserve a passing notice.

Whenever a member of a family falls sick, the most natural thing is to take him or her to the sleeping apartment usually occupied by that person, irrespective of its position in the house. It frequently happens that the patient, once laid upon the sick bed, has to remain there for days, weeks, or months; and there is often occasion for regret that a more suitable apartment had not been chosen in the outset.

We should exercise a little forethought, therefore, in conveying an invalid to what is to be his world for a considerable time. Its position in respect to accessibility, and freedom from noise or disturbance, must be thought of. The top of the house, if it be not too lofty, is often the best for the invalid, being farthest removed from bad smells, and from the noise of children or servants. But the aspect of the room is a more essential thing. Whenever choice is allowed us, we should choose such an aspect as that the sun's rays may enter the sick room for a good portion of the day, *if we will let them.* And as an invalid generally sits up in the latter portion of the day, if he is able, a south-west or westerly aspect is the best. The only drawback to these aspects is the force with which, in exposed situations, the wind and

rain beat against the windows on the westerly side of a house.

I have already advised that a patient who is confined upstairs for a lengthened period should have two rooms allotted him whenever practicable; and when it is not, he should change his room altogether after a time. By this plan his former room may undergo a complete purification. In many instances, the complete change of air thus obtained has saved the life of the patient, and it is always desirable for the sake of the nurse or other attendants and visitors of the sick.

CHAPTER II.

DIET AND REGIMEN OF THE SICK.

DIET.—We will now suppose the patient to be sufficiently recovered to be able to take various kinds of food, and also some exercise, active or passive, during each day. It is now no longer a question of gruel, milk and water, arrowroot, or jelly; those things were strictly under the direction of the medical attendant whilst the patient was in danger. *Now* the convalescent is often left to cater more for himself, and his appetite ranges over a larger area of comestibles than heretofore.

The first rule *now* is not to present to the invalid more food than he can readily and properly take at *one* time. Better too little than too much; in fact, a small portion of food will often excite his appetite, and make him sarcastically enquire why you give him so little, when a large bowl of soup or a broad slice of meat would have so disgusted him as to cause him to send it away untasted.

But the *want* of food in the system, after a wasting disease, is often much greater than what

the digestive organs can supply. The patient craves for food, and, if you allow him, will often take more than he can digest; the gastric juice is not secreted in the same quantity or strength as when in health, although, possibly, even more food may be requisite to repair the waste of tissue left by the ravages of disease. The remedy for this state of things is, to give a large portion of the nutriment still in a liquid form, as beef tea or veal broth, which are absorbed without taxing the digestive organs to any great extent. This remark does not apply in equal force to farinaceous substances, administered in a semi-fluid state; such as arrowroot, rice milk, sago, &c;—these things require a good deal of saliva and the juices of the small intestines properly to digest them, and these juices are often either entirely suppressed, or secreted but scantily, in acute disease.

Animal and Vegetable Food.—In selecting food from the two divisions of nature, the animal and the vegetable kingdom respectively, we have to observe which part of the digestive apparatus we can best draw upon to assist in its assimilation, inasmuch as the more nutritive animal matters are digested in a different manner, and by a *different portion of the digestive organs*, to the carbonaceous, starchy, oily, and sugary substances derived from the vegetable world.

Thus, animal broths require *some* gastric juice to digest them; and this taxes the powers of the

stomach. In the commencement of acute diseases, the secretion of this fluid seems to be altogether stopped, and then animal food or broth will cause discomfort, perhaps vomiting, whilst in the stomach, and at length will be pushed forwards by painful contractions of that organ into the intestines, where, coming in an undigested form, they will cause irritation and diarrhœa. In this case we must confine our choice to vegetable matters—farinaceous kinds of food, as they are called — such as thin gruel, arrowroot, rice water, &c. The action of the mouth alone is sufficient to partially digest these substances by admixture with the saliva, and they can be passed down into the intestines without causing there the same irritation as animal matters would do. This at the *commencement* of illness. After a time, however, there arise several reasons why we should reject these substances and replace them by albuminous and more strengthening kinds of food.

As illness proceeds, the mouth becomes first clammy, then dry; all moisture being dried up. Now there is nothing here to mix with these farinaceous substances which the saliva would partly digest, and they are passed into the stomach in an unfit state to be acted upon by it. Hence they are not digested at all, but are passed, a large proportion of them, into the intestines very nearly in the same state in which they were taken into the mouth.

But as the saliva fails, the stomach may be regaining some power. Gastric juice will be poured out in small quantity in answer to more *stimulating* food; so that beef tea, and other good broths, with salt and a little cayenne, will now be digested when the others fail.

There is now another reason for replacing the light farinaceous food of the first days of illness with animal broths; and that is, that a wonderful sympathy, or rather cooperation, exists between the several vital forces of the system. As the latter comes to demand fresh supplies to replace the waste nature has purposely caused, the stomach attains the power of granting those supplies by renewed vigour, and a more natural circulation of its peculiar fluids. Thus, if beef tea be wanted, it can *generally* be given; and in those cases in which, either from the patient's insensibility or extreme exhaustion, he is unable to swallow, we must administer the restorative fluid by means of the rectum, whence a portion of it will be absorbed into the circulation.

Again: the more rapid manner in which beef tea and other animal broths are digested when they *are* digested, makes them the most proper things to give when food is required at very short intervals. Were we to give arrowroot, rice, sago, or such things, as frequently as we can do beef tea, the stomach would immediately become disordered, and sickness or diarrhœa, or both, supervene.

The flatulence which is often occasioned by either kind of food, but especially by the farinaceous kinds, may be removed by the addition of a tablespoonful of lime-water, or of solution of bismuth, to every cupful; or a little brandy may be given as soon as the flatulence discovers itself. If acidity be present, a teaspoonful of sal-volatile, or two of fluid magnesia, will be best.

Food must generally be given to the convalescent *half as often again* as he is accustomed to take it when in health; and of course, as a corollary to this, the quantity given at one time should in *every such case* be small. It is from neglect of this rule that so much difficulty is experienced with convalescents in the way of digestion. Recollect that it is not 'what is *eaten*, but what is *digested*, that nourishes.' Therefore, do not boast of the *quantity* which you have coaxed your patient to take at *one* time, but rather take credit for the whole amount you have been able to throw in during the twenty-four hours.

After an early cup of tea or milk, breakfast may be taken, say about 9 o'clock; then there should be a supply of beef tea, or a light pudding, at 12, or earlier if the breakfast have been very scanty. Dinner may come at 2 or 3; to be followed, in from one to two hours, by a cup of tea, *without* other food. *Coffee is inadmissible* in sickness, as arresting, instead of promoting, the latter part of the digestive process. But good

black tea, not too strong, warms and soothes the stomach, allaying the irritation caused by the act of digestion, and washing out of that organ any remains of the previous meal, so as to induce a feeling of satisfaction and comfort.

Then comes the evening meal. This will consist of something intermediate between dinner and a light tea. Broiled fish, an egg, or light pudding, will come in very well.

As a *last* thing, nothing is so good as a little arrowroot in water, or with milk, with, if allowable, a teaspoonful or two of brandy; or a small cup of plain cocoa or chocolate, with bread and butter. Weakly persons are often prevented from getting to sleep for want of some light material for the stomach to engage upon.

Nevertheless, it is not good to take anything like a heavy meal in the latter part of the day. The stomach, debilitated by disease, is doubly so after it has done its work of the day. You have called forth all its energies to get the bit of meat digested, and it is therefore bad policy to make demands upon it to which it is unable to respond. Certainly, such things as cheese, meat, eggs, and other solid albuminous substances, should not enter into the convalescent's last meal. If much nourishment be needed at the close of the day, you may give beef tea, or, what is better still, Gillon's essence of beef, which can now be procured in every town. This essence, prepared by hydraulic pressure upon the fresh meat, possesses

the inestimable advantage that, whilst given neat, it forms one of the most stimulating and powerful foods which we can exhibit, it can be so diluted with water as scarcely to exceed in strength a mere drink. If solid animal food *must* be given, a few oysters, or a bit of tripe, will be the lightest thing you can fix upon.

Should food be required in the night, some jelly or blanc-mange, or milk, will be most readily taken, as they can be given to a patient whilst he is half asleep. Their cool feel will also be very agreeable to the parched mouth.

If I have not, in this description of the mode of exhibiting food to a sick person, gone in detail into the merits of the various sick-room dishes and messes, it is because the specific distinctions of food will be discussed in the *third* part of this work, when I shall speak of the diet proper for advanced convalescence, and because I am not desirous of fostering the fashionable slang of pseudo-science, which professes to see important differences in articles of diet which to all intents and purposes are the same, only varying in their acceptability to individual persons. Thus there is absolutely no choice to be made amongst such things as rice, sago, tapioca, semolina, American corn-flour, &c., except in so far as the patient may fancy one of them more than another; and then the *fancy* should always be yielded to. And, although beef-tea certainly holds a sort of kingship amongst soups and broths, there are

others which, if well made, will prove very good substitutes for it in the case of its being disliked. But eggs, milk, batter-puddings with gravy over them, and custards, are on a higher level; presenting, as they do, some of the best qualities of both animal and vegetable foods.

The taste and agreeability of the food to the patient's fancy are very often of more consequence than its exact dietetical nutritive value. All food should be prepared *fresh every day.* Soups, hashes, and things made from the meal of the day before, are abominations. In hot weather epecially, rapid changes take place in all prepared dishes, as soups; and that which would have been easily digested on the first day will excite heart-burn, acidity, flatulence, and perhaps diarrhœa, on the second.

Never give food to a hungry convalescent too finely minced. He is apt to bolt it, to save his weak jaws the trouble of mastication, and thus it will not be sufficiently mixed with the saliva for good digestion.*

* Almost the greatest agony I ever witnessed was caused by neglect of this rule. A gentleman convalescing from an attack of inflammation of the lungs, having experienced appetite, ate at a late dinner a hearty meal of minced veal; it was minced very small, and well mixed with gravy, &c., so as to glide down with ease without mastication. In the middle of the night I was called to this person, who was said to be absolutely in a dying state. I found him *in too great pain to die.* He was sitting by a large fire, shivering, whilst great drops of cold sweat ran down his face and body, which was swathed in two or three blankets.

Variety is another essential in the diet of the sick-room. An invalid can seldom be induced to eat of the same dish two days in succession with relish. Fish will sometimes have to be substituted for meat, and then an egg with the next meal will be required to supplement the deficiency in nutrient value. Light puddings made of batter may have the gravy of roast meat poured over them, or some of Gillon's essence of meat made hot. In this way both animal and farinaceous food may be exhibited without the risk which arises from solid meat on the one hand, and from the bulk which a meal of rice, sago, &c. entails on the other. When the patient first begins to take meat, beware of following too closely the old dictum about mutton and a few other favourite articles of diet. Mutton, mutton, always mutton, is, if anything, worse than the *toujours perdrix*. The easy digestibility of mutton has become a mere cuckoo-cry by which the invalid is robbed of his proper choice of food, and the cook confirmed in laziness. It is quite true that *good* mutton, of proper age and well hung (not a day too long, though), is as digestible as most other

He was nearly pulseless, and his face wore an expression of the most intense suffering. The pain in the stomach and bowels was indeed excruciating. On learning the indiscretion of the preceding evening, I administered an emetic of sulphate of zinc; when the enemy, in a perfectly undigested state, was ejected from his stomach in immense quantities; and soon after, my patient was put to bed in a warm perspiration, with a good full pulse, and quite free from pain.

animal substances, although certainly not more so than some of them; but this does not apply to *bad* mutton—too lean, ill-fed, tough, or ill-flavoured—which is often served up as the 'most digestible of meats.' Good beef is certainly better than bad mutton, and, perhaps, tender pork also.

Another home prejudice prevails in favour of what *is called* chicken in the sick-room. When do old hens cease to be *chickens*, I wonder? Clearly not until they have passed from the hands of the vendor into ours! Now, as a rule, brown meat is more digestible than white, because it is more savoury, and therefore more stimulating to the stomach. Thus the legs, wings, and back of poultry are better than the breast, which is always dry, hard, and tasteless, except they be very young. Partridge is more digestible than pheasant for the same reason.

No poultry more than one year old is fit for an invalid, except to make broth, or to be boiled to a jelly. Its hard stringy fibre is far more indigestible than tender mutton, beef, or even pork. But young chickens, lamb, and such immature food are useful as a *beginning*, when the powers of the stomach are still very weak; but they contain much less nourishment than is commonly supposed, and should be exchanged for more mature meat so soon as the digestive powers are equal to its solution.

Game, plainly dressed, is generally safe as soon as animal food can be taken at all. When its

price forbids its use, tripe and cow-heel, sweetbreads, and even liver, are good substitutes.

DRINK. — With all the light which modern science has thrown upon our common food and common drink, old prejudices cling about us like old garments, impossible to be quite got rid of. We don our new and enlightened ideas on occasion, when we desire to be thought to be up 'to the mark,' and 'moving with the times;' but we are uneasy in them, and glad to put them off when we regain the privacy of our houses, and don again the good old prejudices which have 'served us so well.'

Foremost amongst these prejudices, as regards the sick, stands the dread of cold water as a drink. 'What! drink *cold* water? So raw and cold as it must be on the stomach.' This is the universal creed of nurses, and they are too often the autocrats of the sick-room. As to the cold, it is easy to bring the temperature of water up to that of the atmosphere; and what can be meant by the term *raw*, as applied to pure water, the element which composes nearly nine parts out of ten of the substance of your bodies and eight parts out of ten of the blood itself, it will puzzle a physiologist to say. What torments, ere now, have not poor fever patients been made to suffer on account of this fatal prejudice against cold water, for want of the slightest glimmering of the reasoning faculty on the part of their attendants! How they burn and rave and toss, and suffer the

most dreadful torments, whilst these wiseacres deny them even a drop of cold water to wet their parched lips, to quench their raging thirst! Even now, the water, though no longer entirely withheld, is made mawkish and unrefreshing by having a great black toast put into it, half-rotten apples, or some sweet messes; or its efficacy against thirst destroyed by the admixture with it of wine or brandy. Why not give salt-and-water at once? It would succeed very nearly as well as some of those messes which, under the name of sick-room drinks or diet drinks, disgust the palate of the invalid and sicken it against his food.

WATER.—Water, clean, pure, fresh, and not much colder than the surrounding atmosphere of the room—that is, 60°—is *always* a safe, proper, and useful drink for the purpose of quenching thirst, and allaying feverish heat of the mouth, throat, or stomach. I can call to mind no disease in which the patient may not indulge in plain water to the extent of his *natural* thirst. There may be certain reasons for giving toast-and-water, orange-water, lemonade, &c. in some cases; but it is a great mistake to suppose that, as slakers of thirst, or as coolers of fever, they are equal to cold water. When the mouth and palate are so parched and dry that they are unable to taste the plain water, mild acidulated drinks may be preferable. Barley-water is an excellent drink in those diseases where great irritability of the stomach, intestines, or bladder exists, on account

of its mucilaginous nature; yet doubtless, in other cases, it is not to be preferred to simple water.

Never give a large quantity of any kind of drink at one time. It will be apt to cause painful distension of the stomach, flatulence, diarrhœa, or other distressing result. This is particularly necessary to be observed in taking drink soon after a meal: if the quantity be large, it will wash the partially digested food out of the stomach too quickly, which, entering the intestines before it is properly prepared for them, will probably excite irritation and pain, followed by the natural effort to get rid of the offensive matter by means of diarrhœa.

The question of the propriety of drinking with meals has now been settled in the affirmative. A moderate quantity of fluid conduces to the easy and speedy digestion of solid food by carrying the gastric juice into every part of it, and so facilitating its disintegration. It also excites a flow of saliva in passing through the mouth, which is of the greatest service to the digestive process.

The demand for drink in sickness is often greater than in health, because the mouth and throat are so dried by fever that mastication cannot be effected without frequently wetting the mucous membrane with some bland fluid.

Stimulants.—The question of giving or withholding stimulants in acute disease has now been abandoned to the decision of the physician by all but the most rabid teetotaller. Hence they are

manifestly removed from the domain of diet, and handed over to that of medicine. The time for taking them, and the manner, and the quantity, must all be left to the decision of the doctor.

When they have been so ordered, however, or when common sense and common experience dictate their use by the convalescent, much of their efficacy will depend upon the *time* and *manner* of exhibition.

Let us consider the reasons for which stimulants are given to sick persons:—

Stimulants are given, in general, to answer *two* distinct purposes; and it is quite necessary to keep this distinction in view. *First*, they are ordered by the physician with a view to sustain the force of the circulation—that is, the power of the heart—whilst the system is deprived of the force derived from food, or whilst it is slowly and laboriously gaining strength from it. In these cases they make up, in a greater or less degree, for the failure of direct nutriment.

Now, to attain the end we have in view in this case, stimulants must be given with the regularity and precision of medicine, which, indeed, they are. One dose must follow another in tolerably quick succession, otherwise the effect of the first will have passed away before we repeat it. The medical attendant, therefore, should lay down clear rules to be followed, as regards rapidity and quantity, in every such case, taking as his

guide the effect produced upon the heart's action. *Secondly*, a *small* quantity of stimulant may be given as a fillip to the appetite, to ward off exhaustion, or to rouse the flagging nervous energies which often make convalescence so tedious. In this case, exactly the opposite mode of action to the above is to be observed. Here, we must never make stimulants the *substitute* for food. They must come in only as auxiliaries to assist in the digestion and assimilation of solid aliment; or, at least, to whip the torpid stomach to the performance of its task.

Many people will offer a patient a glass of wine, and perhaps a biscuit, at 12 or 1 o'clock, when he declares he wants *something*. And so he does; but it is food that he wants, not stimulants. Now this is a bad practice. You cheat the system out of the real food required by it, by giving what, after all, is but the shadow of it; and you set the digestive organs at work upon the trifle of a biscuit, and thereby waste the gastric juice which should be reserved to cope with a larger meal. It is true that the patient's feeling of want is assuaged for a time, but you have done nothing towards his recovery. Whenever food *can* be taken, it *should* be taken, during convalescence from severe disease. Now the glass of wine, given just before the food, or with the first portion of it, will give the stomach a fillip which will cause it to do its office more satisfactorily.

As the power of digestion returns, the intervals

between meal and meal should be lengthened, until the meals are reduced to the usual number. Many well-intentioned persons often make a mistake in this respect by continuing to give some extra dish—as a bowl of soup, or an egg or two—at a time when the convalescent is taking all his meals as usual, and imbibing quite as much food as he can digest. These errors are a frequent cause of that feeling of distension, languor, flatulence, &c., after taking food, which is so generally complained of. So, also, an analogous error creeps into the invalid's diet, viz. using too nutritious and albuminous substances far into his convalescence. Such rich food palls upon the stomach at length, owing to the want of bodily exercise to make room for it, until the digestion begins to fail, and the patient is put back in his road towards recovery by several good days' journey. Here fresh air and muscular exertion are the things required, not too abundant a diet.

CHAPTER III.

QUALIFICATIONS OF THE NURSE.

It may be said without question that the duties of the nurse require the possession of some of the highest qualities of our nature. And yet, until lately, it was held that those who were fit for nothing else would do very well to nurse the sick! The admirable publication of Miss Nightingale probably did more than anything else to rouse the public mind to the fatal evils which result from the employment of ignorant, incapable, or unprincipled persons to nurse the sick. Her graphic pen exhibited to both lay and professional persons the blunders, the apathy, and the selfishness which characterise a large portion of those who assume, either from choice or necessity, the responsible and all-important duties of a nurse. Those words of angry reproof, of biting satire, and honest contempt for the ignorance and sloth, the ridiculous conceit, the falsehood, and the selfishness which are too often displayed in the sick-room, burnt their way into the minds of her numerous readers, and may be considered as

having inaugurated a new era in the tending of the sick-bed.

But although the two qualities of skill and good sense are inseparable from the character of a good nurse, one other quality, not insisted upon by Miss Nightingale with equal force, is requisite before her character can be pronounced complete. This quality is Love!

SYMPATHY.—Not that it is necessary for a nurse, particularly a hired one, to feel *personal* love towards the object of her attentions. Her relations towards him or her may forbid that. But she ought to love her sacred calling, to reverence all those whose duty it is to minister to the spiritual or temporal comfort of the sick, always remembering WHO it was who commanded us 'to do unto others as we would that they should do unto us.' Instead of murmuring at her time being occupied with the often irksome duties of the sick-room, her exclusion from the fresh air, or from pleasant society, she should regard her duties as a pleasure—a mournful one, perhaps, but still a pleasure. If a wife, daughter, or relative of the invalid, she ought to feel that *now* is the time for her to repay some portion of the debt she owes to a kind protector, a tender parent, or a devoted friend.

Sickness, coming from God, ought to be regarded as a sacred thing. The cant which we are accustomed to hear about the repulsive and disagreeable offices which close attendance upon

the sick necessitates, is simply either so much affectation put on to obtain the greater credit for the performance of a simple duty, or else so much false pretence to excuse the neglect of it. We are taught by the highest authority to love one another; and our strongest and most distinctive mark of severance from the brutes, and of superiority to the savage, is to be found in the care which we bestow upon the weak, the aged, and the sick.

And, in truth, all nursing, to be effective, must be founded upon a Christian sympathy with misery and pain. If the battle-worn soldier, instead of crawling to seek the shelter of his tent after the fatigue and dangers of the day, stays to pillow the head of his wounded comrade upon his knee throughout the cold dark watches of the night, to wipe the clammy death-sweat from his brow, or moisten his burning lips with the drop of water he denies to his own, is it not love which prompts the action? When the lady visitor, or the Sister of Mercy, leaving the ease and comfort with which wealth surrounds her, goes to tend the poor stricken labourer whilst his wife is absent trying to earn a pittance to purchase that bread for her children which the husband can no longer give them—to sit by his squalid couch, to tend his little wants, to read to him the Book of Life—is it not also love which prompts the action?

Yes! this is nursing of the best kind. Sympathy, skill, gentleness, alacrity are here com-

bined; and well would it be for society could thousands of our more leisured classes be made to feel the dignity, the importance, the moral elevation, which the performance of such duties for their poorer suffering fellow-creatures implies.

And you, young ladies of high education, yet with the deep sympathies of the female breast all unoccupied, your budding benevolence languishing without an object! here will you find occupation for them all. Here you may carry your instruction to the sick-bed of the poor, the ignorant, the gross. Your full purses will afford them material comforts whilst your unused benevolence flows in sympathy and loving-kindness for your less fortunate fellow-Christians. Here is the action you yearn for! Here is a field for your pent-up energies — those energies which daily-increasing wealth and refinement are daily restraining within narrower and narrower limits!

You need not think that your delicacy and refined sensibility will be shocked. No rude thoughts, couched in gross language, will assail your ears. No words of offence will escape the lips of the lowest and coarsest to offend the delicate ears of woman so occupied. Sickness softens even the hardest natures, and kindness exhibited in their distress is seldom repaid by contumely or repulsed by moroseness. But let it be *genuine*. There must be no baser metal alloyed with the pure gold of your charity. The perceptions of the sick are often very acute, and they readily detect

anything approaching to cant, hypocrisy, or overbearing patronage in your manner. If love be not felt, the sound of the word will fall empty and dead upon the ears of the sick man, and a suspicious smile or a mocking sneer will occupy the features which would otherwise be covered with tears of gratitude. Nothing, I hold, can exceed the hardness of that woman's heart towards suffering or misery into which love has either never entered, or from which it has been all trodden out.

Where a nurse has to be hired, there is great responsibility in the choice of one. Here you are not sure beforehand either of love, skill, or good sense; whereas you should have all three. A nurse who makes the care of the sick her calling should feel the dignity of her duties, and feel proud of them. She should know and feel the sanctity of sickness from a knowledge of the Hand that inflicts it, and of the blessed reward promised to those who give but a 'cup of cold water' to one of His little ones, and in His name.

Amongst hired nurses, as a rule, I should prefer a young person to an old one, if equally skilled. The youthful heart is the most sympathetic in this class of persons; and it often happens that long habit of tending those regarding whom the nurse has no other feeling than that of earning her wages inures her to suffering, and produces insensibility and indifference. This is but human nature; and we must be content in most cases to

relinquish the ready but unskilled attentions which spring from sympathy for the slower and colder, but more skilled aid which a mere sense of duty dictates.

Anyhow, care should be taken that the nurse is a healthy and active person; that she be quicksighted, gentle, silent, cleanly, and humble. As Dr. West* has well observed, the youngest doctor is more skilled in disease than the most experienced nurse, and therefore any conceit of *doctoring* should be a disqualification at once; whilst any disobedience of the doctor's orders, or quiet underhand opposition to them, should be the signal for her dismissal. Many a patient's death has been caused by this insidious and dishonest thwarting of the views and endeavours of the medical attendant, which, disgraceful and foolish though it be, the friends of the patient are sometimes guilty of encouraging.

Discretion.—Although the nurse should be quick of perception, she should not be too ready to show her observations to the patient. Discretion is of even more consequence than perception, since a lack of the latter quality may be made up by the tact of others; but a deficiency in the former is sure to be of evil consequence to the sufferer. She should be sufficiently acquainted with the aspect of disease to know its various phases as exhibited in the countenance and in the movements of the sick; and also with the material

* 'How to Nurse Sick Children.' Longmans, 1860.

points in most disorders, so as not to mistake important for insignificant symptoms.

NEATNESS.—The dress of the nurse is not unimportant. In every case it should be simple, neat, and scrupulously clean. The material of which it is made should be soft and supple. Rustling silk and starched muslin are equally out of place in the sick-room: the first annoys the patient's ears, whilst the latter suggests that the nurse wants to be gadding abroad.

To a sensitive mind, and amongst the more refined classes, these matters are not unimportant. Indeed, they become *necessaries*, since the temper of the excited patient is ruffled by things which, in health, he would despise himself for noticing. And I would recommend even friend-nurses—wives, daughters, sisters—to be equally careful in the matter of dress. This should indicate the nature of the duties they are engaged in. If you go about the sick man's room with your hair in paper, and your person untidy, you remind the invalid of the sacrifice which his illness is entailing upon you, whilst you show no disposition to please his eye by neatness and order. On the contrary, the scrupulous neatness and cleanliness of your own person form a vivid and agreeable contrast to his own wasted and unkempt frame.

TACT.—With all her vigilance, a nurse should know when to absent herself from the sick-room. Kind-hearted friends, even ladies, will often offer

to stay in the room whilst the offices of nature are performed. God forbid that they should not do everything, without offence, when *necessary*! But they should know that men are almost more nice about these matters than women; and it annoys a patient excessively, when well enough to be left, if he cannot have the room to himself on certain occasions. Again, many a bath is declined by a sick person from the fear of the exposure which it will entail; whilst, were everything properly prepared for him beforehand, he could manage it for himself. Indeed, there need be no exposure at all; for if a blanket be given to the patient to pin round the waist, and a shawl to throw over the shoulders, they can be slipped off when he is already immersed in the water.

A nurse should be able to write legibly and intelligently, and so be able to note down on paper the symptoms and events as they occur during the absence of the medical attendant. A daily, and in some cases an hourly, record of the state of the patient should be kept. His food, his sleep, the heat or coldness of his skin, the secretions of the bowels and kidneys, delirium, &c., should be all set down in order as they occur according to time, as well as the giving of medicine and its manifest effects.*

* Dr. West, in his excellent little book of directions for nursing sick children, referred to above, advises the nurse to take a sheet of paper and divide it into five columns—'one for food, another for medicine, a third for sleep, a fourth for the evacuations, and *a fifth for any special* point of importance that may arise.'

TEMPERANCE.—No hired nurse who drinks anything stronger than beer should be allowed in a sick-room—no Mrs. Gamp to 'put the bottle on the chimleypiece that she may take a drop when she feels dispoged.' If the nurse be addicted to tippling, it is ten to one that she has some private store; and, much as she loves it herself, you can never be sure that she will not give some of the 'precious stuff' to her patient, either to sleep it, if a child, or as a bribe, if older.

RESPECT FOR HUMAN LIFE.—Another bad quality in a nurse, and one which is almost universal amongst the lower classes, especially if she be old, is a want of respect for the sanctity of human life. If the nurse be given to make light of the result of illness; if she be in the habit of saying, 'Ah! poor thing, it's a good thing it's gone; out of it's sufferings; better off where it is now,' and so on; or, if the patient be poor, 'Ah! poor creature, he's gone to a better place; it's a happy release for him,' &c.; do not trust her. No doubt these expressions are all right, if the spirit which dictates them be all right. In a spiritual point of view, we may all rejoice when anyone is released from suffering or misery; but the old nurse does not mean it in this light. She rejoices that her trouble is at length at an end; that the fractious child is at last quiet, the enfeebled and querulous old man for ever silent.

CHAPTER IV.

DUTIES OF THE NURSE.

THE first thing for the nurse to do, whatever be her station or quality, is to gain the goodwill of the patient. Without that, all her efforts will fail of their object, and the comfort and consolation which she tenders will be shut out of the heart of the invalid. Cheerfulness, and a ready willingness to do all and to bear all for the sufferer's sake—first for love of him, or, if that cannot be—for the love of God, are the first and greatest qualifications of a nurse. Fully impressed with these feelings, her duties will come, as it were, intuitively to her. But let her beware how she 'assumes a virtue if she have it not.' The eyes of sickness are often very sharp, and they quickly detect any crack in the ring of the false metal which is offered to them as genuine. If a man or woman does not rise from a sick-bed with feelings of loving thankfulness towards her who has tended him or her in their illness, the nursing has not been well performed.

At the same time, there need be no parade of

these duties—no insisting to remain in the room when the patient would rather be left alone. Friends will often insist upon sitting up all night by the patient's bed when he has a strong objection to it, and they will appeal to the doctor for authority to have their own way. This may be kindly meant, but it is fuss, not kindness. Remember that they are *his* feelings, not *yours*, that should be gratified.

The nurse's duties will depend very much on the nature of the illness. If there be much general depression, the senses probably stupefied, and the judgment and will altogether in abeyance, she must take her cue from the doctor, and do to the sufferer whatever he orders. Firmly and steadily she takes the patient in hand, and administers food, medicine, &c. by rule, and without reference to the permission of the sick person. An inert patient, poisoned by fever or prostrated by inflammation, will lie for hours without asking for food or drink, whilst an ignorant or careless nurse will sit by and let him sink into irretrievable exhaustion. She will probably tell the doctor or the friends that the *poor dear* has been in a sweet doze, when all the while he has been drifting into eternity.

The greatest care is necessary, in these severe cases, to secure the personal cleanliness of the patient. And here the nurse's tact and attention will be best displayed. Fortunately, there are now instruments so well contrived, for both sexes,

that all soiling of the bed-clothing may be avoided. Gutta-percha bed-pans, wedge-shaped, the more easily to be pushed under the person, and urinals of the same material, are readily procurable. No infirmary or dispensary should be without a stock of these indispensable conveniences to lend out to the poor; and also india-rubber sheeting, pillows, &c.

Next to cleanliness of the patient's person is that of his bedding. You can do no harm to an insensible or very inert patient by removing his body-linen, and the sheets upon which he lies, provided you do not set him in an upright position when the heart's action is very feeble. But if he be sensible, in pain, or very much debilitated, then the greatest care will be required in making these changes. Yet, in fevers and contagious disorders, they are not to be neglected even for a day. The recovery of the patient may depend upon the frequent removal of the emanations which poison the air which he breathes, whilst the risk of infection which the attendants run is pretty much in inverse proportion to the care which is taken of removing the *materies morbi*—the infecting substance—as fast as it is thrown off from the patient's system.

A good plan is to have two or three night-dresses prepared in this manner. Let them be cut up the front, not the back, as some have recommended, and some tapes to secure the two sides sewn on. It will be found easy to pull off a dress

so prepared, and all dragging upon the patient's limbs will be prevented. If he cannot be lifted up, the nightgown may be removed as he lies, and the patient may be drawn on to a fresh one ready opened beside him.

One of the great advantages of keeping the room of a proper temperature is to be found in its allowing of the bed-clothing being kept light, so as not to oppress the invalid by its weight. A couple of blankets and a light quilt will be generally sufficient, provided the temperature of the room be kept at 60°, or a degree or two above it. It is astonishing, too, how much less bed-clothing will be required if the feet be kept warm with flannel, or a stone bottle of hot water wrapped in flannel. Also, when a patient sits up a few hours in the day, if there is a nice hot bottle to warm his feet on returning to bed, it prevents that feeling of chilliness and depression which patients dread so much.

But in every kind of illness it is essential that the extremities, the feet especially, be kept warm. Of course, in a burning fever, they will be hot enough, and tepid sponging of them will be the most soothing thing you can do; but in nine cases out of ten, especially if the illness have endured for any length of time, the feet have a tendency to become too cold.

The head should be kept cool in all cases *where the heat of the skin is above the natural standard.* There must be no caps, handkerchiefs,

or shawls wrapped about it. If the head be preternaturally hot, remove the feather bolster and pillows altogether, and supply their place with horsehair cushions or water-pillows. A good plan is to have a long, flat horsehair cushion made to slant from the patient's shoulders to the head of the bed, so that he may be placed upon it in a more or less erect posture, as may be desirable.

The position of the patient in bed is an important matter. In diseases of the brain, face, or chest, it will generally be necessary to keep the head and shoulders raised at an angle of from 10° to 45° with the bed. In the case of congestion or inflammation about the head or face, this is requisite to prevent the too great rush of blood to the diseased parts, and to facilitate its return by taking off all pressure upon the veins of the neck. When the lungs or air-passages are affected, and particularly if expectoration be copious, there is also equal necessity for the semi-erect position, to allow of coughing and spitting without raising the chest from the bed.

Again, whenever the patient is extremely weak, and takes food or drink with difficulty, even though he may require the flat position, it is useful to have a thin wedge-shaped horsehair pillow to push under his head and neck whilst you administer food or medicine. It is impossible for the sick to swallow comfortably or with safety whilst quite *flat*. Another little manœuvre which will be

found useful in practice, when the patient is seriously ill, is for him to occupy only one side of the bed at a time. On waking in the morning, he will find it grateful to his feelings to move to a fresh, cool part of the bed, whilst he takes his breakfast and is made comfortable for the morning. This is the day side, as the other is the night side, of the patient's little world.

Bed Sores.—In the course of long and debilitating diseases it is not easy to prevent bed-sores. It can only be effectually done by early attention to *position*. If the nurse will, for some portion of every day, raise each side of the patient's body at the hips by means of thin water-cushions, or soft pads stuffed with cotton-wool, so as to take off the weight of the body from that part *for a time*, the tendency of the skin to inflame and slough will be greatly diminished. Little pads made of cotton wadding may also be pushed under any tender part; and the elbows, heels, and knees of the patient should also be protected from pressure in the same way.*

The invalid should always have within his reach his drink, his spitting-cup if he have cough, and a urinal. If these things be at hand, it will save the nurse from rising and bustling about the room when everything should be still.

It need scarcely be mentioned here, did we not

* I have even seen, in females, the skin of one bosom severely excoriated by the pressure of the other upon it, which a simple pad of cotton-wool would have prevented.

find in practice so much want of thought about little things, that there should always be a little cuisine *in* the patient's room. All the small utensils necessary for his use, or about the room, should be at hand. A table—as Miss Nightingale has observed, with the admirable tact for small as well as for great emergencies which she has always exhibited—*covered with a cloth to prevent rattle*, should have placed upon it a knife and fork, a few spoons of different sizes, teacups and a plate, a jug for holding drink, medicine and medicine-glasses, together with some kind of jelly, jam, or fruit.

CHAPTER V.

TWENTY-FOUR HOURS IN THE SICK-ROOM.

It may perhaps facilitate the comprehension of her duties by the nurse, especially the amateur nurse, if I describe the occurrences of twenty-four hours, as they will generally be found in a case of severe illness, and the mode in which the nurse's aid should be rendered in each particular.

Let us begin with the day. In the early morning, the first thing to be done is to see if the patient be awake; and if so, to offer nourishment or drink. Now it is that a cup of tea or a little warm milk will be so acceptable. If medicine has to be given at this time, let it follow the tea or other drink, lest it nauseate the patient's empty stomach. After this, the invalid will probably doze again; and if the night have been a sleepless one, he will probably get his first repose after taking a little nourishment.

The proper time for breakfast will be when the patient is ready for it. He must never be awakened out of sleep for it (except in the case which will be hereafter mentioned). In very severe ill-

ness, the kind and manner of administering food must be in exact accordance with the physician's orders; and if he has neglected to specify what it should be, lose no time in enquiring it of him. After breakfast the patient will feel refreshed, sufficiently so perhaps to be washed and made tidy. If I were to see a nurse performing this part of her duties, I could tell at once whether she understood her business. I should observe whether the invalid flinched from, and shuddered at, the process; and whether it were done gently but efficiently, or rashly and in a slovenly manner.

If the patient be very weak indeed, he must not be washed, but sponged as he lies supine. But you are not to take a rough towel, and, thrusting your fist into it, wipe over the face and neck of the sufferer, whilst one end hangs down over his mouth and half-suffocates him. Take a small soft sponge, well wetted with warm water, and pass it lightly over the face, neck, bosom, arms, and hands of the patient, without moving him in the least. Each part, as it is done, is to be dried with a soft warm towel. If the patient be able to bear it, the lower limbs may be sponged, at least that portion of them which can be reached, and especially the feet—never uncovering more than one limb at a time. All this can be done in two or three minutes of time, with little exposure, and, if the temperature of the room be proper, without the slightest risk of giving cold.

Nothing so refreshes the weary and clammy

limbs of the patient as this daily sponging. Its amount and frequency will vary, of course, according to the strength of the patient and the nature of his illness, which will be adverted to presently; but, if properly performed, there are few cases of illness in which it will not tend most materially to facilitate recovery. In fevers, and all eruptive diseases, such as measles, scarlatina, and erysipelas, it is indispensable, and in many chronic as well as acute disorders not much less so. The temperature of the water must vary from 92° to 75°, according to circumstances; during convalescence we can gradually reduce it until we come to simple cold sponging. To admit of the nurse getting easily to both sides of the patient, the bed should never be pushed close against the wall.

The washing over, and the patient endued with clean linen, or rather cotton (for linen is inadmissible in the sick-bed), the sheets may be withdrawn from the foot of the bed without uncovering the person. Every few days, especially if there is much perspiration, the blankets must be removed and well dried before a large fire. If there be contagion, all woollen materials should be put into an oven heated to 160°; such a heat as remains when the bread is withdrawn. By this means only will contagious matter be effectually destroyed. Until this can be done, they should be freely exposed to the vapour of chlorine.

Now is the time to leave the patient a little to himself. He likes to be left alone sometimes,

that he may reflect upon his condition, or arrange pressing affairs in his mind. And now is the time for the wife or daughter to consult him upon whatever is *absolutely necessary* to be mentioned to him, provided the patient be able to bear it, and the doctor do not object. Now, too, is the time for the doctor's visit. It is true that he cannot see every one of his patients in the forenoon; but wherever there is dangerous illness the conscientious practitioner will use every effort to make his visit to that case the first.

And how the sick man looks forward to this visit, none but those who have themselves suffered can tell. Do not disappoint him, therefore, if it can possibly be helped. There are many other urgent reasons for an early visit from the doctor; say from 10 to 11 o'clock. The questions of diet, of rising or remaining in bed, have to be discussed, and the secretions (already removed to another room) to be enquired into.

After breakfast, too, is the time for the ventilation of the apartment; before the doctor's visit. This must be effected in the manner already described under that head in the first chapter.

Then will come food and medicine—the noonday or ante-noonday meal. In all cases this meal will be required, for no sick person should be long without sustenance of some kind; and if he can take it at all, he can do so about midday. Remember that the smaller the quantity that can be taken, the oftener must it be offered.

Here, however, one caution—a caution constantly iterated by Miss Nightingale: 'never offer a patient the *same* mess of food which he has once refused.' If it has stood long, it is no longer nice; and even if not, it will appear to the sick man that you grudge the trouble of making fresh. Of course this does not apply to such expensive things as wine, jelly, &c.; or to the very poor, who can obtain such luxuries perhaps but once.

Food must be given to the inert or semi-insensible patient—as to children, that is—authoritatively but kindly. Let them know, if you can, that it is necessary, and *must* be taken. They will soon, both the man and the child, yield to your determination, if only for the sake of the quiet which follows their submission.

If the patient be able to take food, and the stomach do not reject it, you can never be doing wrong in giving *all* that the doctor has ordered; and, except in the mode of giving, your cue as to food should always be taken from him.

It may economise space if I here set down, in an axiomatic form, the main principles which should guide the nurse in administering food and medicine to a sick person.

Food.

1. *Where food is the* primary *object, as it generally is in severe or protracted illness, especially if accompanied with much wasting, let it be the prime thing attended to.*

2. *Let neither the patient's sleep, inclination, or temper, nor the interference of friends, prevent you from doing that upon which his life may depend.*

3. *But when the patient is well enough to have a choice of quality, quantity, or time of taking food, indulge him as far as reason will allow.*

4. *If much food be required, and but little can be taken at once, every hour or two will not be too often to offer* something.

5. *Drink will often supply the place of solid food, and, if the patient desire it, should never be withheld. Plain water, in small quantities, is* always *safe.*

6. *Remember that the stomach of the sick person partakes of the debility of all the other organs. Therefore, if there be a doubt about his digestive powers, it is best to give food a little easier of digestion than that which the patient may fancy; as broth or fish in place of meat, and gruel or milk instead of the first.*

Medicine.

1. *Never omit giving a dose the doctor has ordered, unless the effect manifestly* exceeds *what he has led you to expect.*

2. *Never, on any account, give a patient medicine or drink unless he is wide awake; or, if he be partly insensible, until you have aroused the sensibility of the throat to the presence of fluid.*

3. *Medicine of disagreeable taste may be swallowed from a cup with a spout long enough to reach to the back of the mouth, as it is then scarcely tasted, especially if the nose be held whilst swallowing. A small piece of bitter orange-peel, chewed both before and after taking nauseous medicines, is the best corrective against their taste. Always rinse the mouth, if able to do so, after taking medicine.*

4. *Never let the medicine stand in the patient's sight before the time of giving it to him: this applies especially to children.*

5. *Never give a sick person, especially if a child, medicine immediately* after *food, unless for special reasons it has been so ordered. The knowledge that the physic is to follow it, will often make him refuse the food.*

Stimulants.

1. *Stimulants must always be given in exact accordance with the orders of the medical attendant, except in the emergency of fainting or sudden collapse, when they may always be given to the extent of bringing the patient round.*

2. *When the patient's life is to be saved by stimulants alone, be content if you can get them* alone *swallowed.*

I now resume the day's duties. If the invalid be entirely confined to bed, the afternoon will be the time he will like to be read to, or conversed

with. He has now expended all his own little energy, and the business of washing, meals, &c. has fatigued him. Now is the time for visitors—the clergyman, the friend, the district visitor; and after the excitement caused by them, bathe his burning temples, chafe his restless limbs, and, if you can, lull him off to sleep upon the soothing although somewhat exhausting impression which the visit of these persons will have had upon him.

Food again—the afternoon meal. Then the collecting in the room of all the clean utensils wanted for the night, and the substitution, when this is requisite, of the night-watcher for her who has been on guard all day.

But it may be that the patient has been able to leave the bed for some portion of the day. If he remain in the *same* room, the washing, ventilating, and tidying should all be done before he rises. It is a great annoyance to an invalid just got to his couch or easy-chair, to see a servant frisking about the room, dusting and *tidying*, and making a clatter.

Few people know how to carry a sick person in their arms properly. If it be a child, of course it is an easy matter; but if a grown-up man or woman, there is more difficulty. This is the way you should go about it. In the case of a female, so much clothing as she is to wear whilst sitting up having been adjusted before lifting her from the bed, come to that side of the bed where there is the most room to turn; then place one arm

under the bend of the knees, and pass the other well round the back on a line with the armpits. Now draw the patient well up against your chest, so that, if necessary, the head may rest against your shoulder. In this way you may carry a person, if not very heavy indeed, upstairs or down, or from one room to another, with ease to yourself, and gentleness to your burden. It is very simple, if gone rightly about; but how seldom it is so! Some get a chair and try to carry the patient in that, the most awkward thing possible. Others put their arms round the patient's neck instead of the back, and so let the spine bend backwards unsupported, thereby frequently causing exquisite pain. Every man should learn to carry a lady in his arms in the manner here described, which prevents all exposure or annoyance to her feelings: he knows not how soon he may be called upon to exercise his skill in this respect. Women should never attempt the office; they have not sufficient strength of loin to bear the strain.

It is now night. In what do the night-nurse's duties differ from those of the day? First, in profound silence. A soft flannel wrapper, noiseless slippers, and a tongue that *can* be still. The temperature of the room is to be kept steadily at 60°. If by means of fire, take care that coals and every other appliance are at hand, that there may be no going in and out of the room.

As regards disturbing the patient in the night,

consider whether sleep or food and medicine are the most essential. In diseases accompanied with great exhaustion, as in the latter half of evers, &c., food is often the prime requisite, *then* let not sleep prevent its regular exhibition. As already observed, many an exhausted fever-patient has passed to his account whilst the nurse has sat by thinking he was enjoying a 'beautiful doze.'

But if the patient's strength be still good, as at the commencement of disease, and when there is also much restlessness and excitement, nothing soothes like sleep. *Then* let everything else give way to 'nature's sweet restorer.'

Have always within the patient's reach, by night, the things mentioned at page 169; also a small hand-bell; and take care that the bottle of hot water is placed at the foot of the bed *before* the patient returns to it.

CHAPTER VI.

CLOTHING, BATHING, AND SPONGING IN THE SICK-ROOM.

On leaving the sick-room, the convalescent will do well to remember that, whatever the season, he has been put back into a kind of artificial summer by the warmth which has been necessarily preserved in it; and his skin has been rendered more than usually sensitive to changes of temperature, owing to the activity in which its function has been kept. Moreover, the powers of reaction against cold are still feeble—much below par. Let him, therefore, not neglect to take proper precautions both against changes in the atmosphere, and also against getting a sudden chill after taking exercise.

Section I.—Clothing.

The clothing, therefore, of the invalid, whilst it will have reference to the season, should go a little *beyond* the season. If it be spring when the patient leaves his room, let him begin with winter clothing; if summer, with that of spring.

And this caution applies particularly to the under-clothing. Extra top-coats or cloaks will oppress a weak person by their weight; whilst a warm flannel vest, two if required, will keep the surface warmer than extra upper-clothing will do, and prevent that feeling of exhaustion which a superabundance of the latter induces.

As soon as the patient is able to make use of *cold* sponging, it will naturally diminish the risk of taking cold on first going out after illness. The improved tone which the use of cold water imparts to the skin and its vessels is, after all, the best safeguard against the ill effects of changes of temperature; and by good management the convalescent may generally be inured to its use before he is able to take outdoor exercise.

It should always be borne in mind, with regard to cold sponging, that it is *no* remedy for exhaustion. Warm and tepid bathing are the proper means for removing the fatigue and restlessness which so often oppress the convalescent during his first essays at exercise.

It will be found, as well when the invalid begins to go out-of-doors as whilst he is confined to his room, that it is the feet and legs which require the most attention. If these are warm, all the rest of the body will be so also. The warm bottle for the carriage in cold weather, and extra warm stockings and drawers, are the prime requisites.

All that is here said about clothing applies with *double* force to the case of children and aged

persons. I am quite sure that hundreds and thousands of children lose their lives, every year, by the thoughtless manner in which they are allowed to go out of doors in the winter and spring months immediately after, aye, even *during* illness. Half of the mortality from the children's diseases of measles, scarlatina, and whooping-cough, is the result of neglect or recklessness in this particular. Then the mode of dress amongst the children of the upper and middle classes in many cases betrays a degree of silliness and stupidity in those who have the charge of them, which, if exhibited in any of the business relations of life, would be set down to a thorough incompetence. The little bare legs of the boys are blue with congested blood, whilst the absurd hoops which female children wear, admit enough cold wind to their vital regions to turn a windmill. Can we wonder that mothers should have to take at least *one half* of their female children about the time of puberty to the doctor, on account of some irregularity or deficiency of function, when but lately the very parts of the body containing most important organs have been exposed to every gust of wind, and to the no less chilling effects of the sail-like sway of the petticoats to and fro, as these puppets of folly walk along?

But to return to invalids. It must ever be borne in mind that convalescence is not merely a process of gaining strength after illness, but it is an *important part of that illness itself*. In a

large majority of cases of disease, there is an increase in the functions of some one or more of the excreting organs during convalescence. The effete and poisonous material which has been used up in the body in its disordered condition has to be got rid of; and it is in the course of convalescence *especially* that these critical discharges are made. This is the case with regard to the specific fevers, smallpox, measles, scarlatina, erysipelas, typhus, and also in rheumatism, gout, &c. Now, in all of these diseases the system makes use of the skin as the *emunctorial* or cleansing organ; and whilst it is acting in this capacity there is an unusual flow of blood to it and excitement of its nerves. The greatest care is now required to prevent the skin from receiving a chill, since any check to the activity of its circulation will cause the morbid material, which was making its exit there, to be thrown back upon the system, where it never fails to cause great mischief—often incurable disease—in some vital region, such as the lungs, the kidneys, or the heart.

The length of time during which this purifying action of the skin continues in operation, varies exceedingly in every disease, and in every individual case. None but the medical attendant can tell at what time it will be safe for the patient to leave off his precautions in this respect. Nor, indeed, are medical men themselves sufficiently careful to warn their patients on this point. Visiting them often, for the last time, whilst conva-

lescence is only half established, the opportunity is wanting; nevertheless, my medical brethren will forgive me for reminding them how many lives are sacrificed at a stage of these diseases, when, with prudence and good advice, the patient has a right to expect a certain recovery.

It is true that one of our greatest adversaries is that conceit of being able to do this, and to brave that, with which people of all classes indue themselves. Where is the *credit* of being able to run counter to all the laws of nature? What praise is due to running risks which may leave the tender wife, the helpless children, the feeble and aged parent, without their natural protectors, in consequence of a foolhardiness, which, as I have already remarked, were it exhibited in any of the business relations of life, would be set down to sheer incompetence or insanity.

It is the height of folly, therefore, to leave our own fate, and that of all depending upon us, at the mercy of a breath of wind. We should be fools to despise our antagonist. He is one who, when his quiver of pestiferous darts is apparently exhausted, has always a secret store of *still more malignant weapons*, against which there is no combating, for they are as unseen and as mysterious as they are destructive and deadly.

Section II.—Bathing.

Bathing, under which term I include sponging as well as all kinds of baths which are used in the *sick-room—sitz, slipper*, sponging, shower, douch,

or vapour,—and at all temperatures, from quite cold water to a hot bath of 110°,—in one or other of its forms, is one of the most important agents in the whole armamentum of hygiene.

Bathing is supposed to succeed to that gentle washing and sponging which is often all that the sick person can endure during his confinement to bed. As soon as he can leave his bed, however, bathing takes a prominent place in the acts of the sick-room; and for two reasons. *First*, it enables the skin to purify the blood by increased action, either by means of the ordinary perspiration, or by that process which I have just described whereby the vestiges of disease are thrown off; and, *secondly*, because during convalescence, some one or other of the internal organs, the lungs for example, still perform their functions imperfectly, and we are obliged to call upon the skin for extra exertion to relieve the sick member of his duties.

This *vicarious* action of the several functions of the body is a very beautiful and a very efficient arrangement of nature. In fact, it is the nearest embodiment of that abstruse entity called the '*vis medicatrix naturæ*,' or the self-curative power of the system, that strict physiology will recognise. If this general uprising of all the vital powers to cast out the invader, disease; this struggle to resist the morbific operation of bad sanatory arrangements; this endeavour to bear up against the depressing influence of overwork, *want*, care, or vicious habits of living,—if this

reactionary power have any local habitation or recognisable status, it must be in the increased work done by those organs which have not succumbed to the morbid influence, and which assume extra vigour in order that the amount of labour which must be done in the body may be got through.

Thus, when the lungs become inflamed, or congested, and are unable to relieve the blood of the quantity of carbonic acid gas and watery vapour which, in health, it is their proper duty to do, the skin must do its own work and that of the lungs also. Increased perspiration either takes place naturally, or should be induced artificially; not only to remove the congestion from the lungs, but to relieve the system of fluid, and so give the lungs less work to do. The same with the kidneys: when these organs decline to perform their important duties, we fly to the skin to get it to remedy the mischief which soon ensues.

It is in this manner, then, chiefly, that Nature strives to relieve herself of her difficulties. As in commerce, when one road by which goods are sent to market is stopped, the traffic in another is doubled, in order that the body-social may suffer as little detriment as possible.

And of what immense value this vicarious action of one organ for another may become, the physician knows full well. By the stoppage of any one of the great secretions of the body—that of the lungs, the kidneys, or the skin—dele-

terious matters are retained in the system, which, if not got rid of in some other way, prove actually poisonous to it. A rapid accumulation of mischiefs now takes place. The brain and spinal chord—the functions of nervous and motor force become oppressed by the circulation of these substances in the blood which feeds them; their powers are diminished, their sensibility blunted, and, if things are not quickly righted, the intellect is extinguished, apoplectic stupor comes on, and vitality is altogether destroyed.

So, then, there is nothing in the whole range of medicine, or its ally, hygienic nursing, *so* important, as to keep this most valuable organ, the skin, in good order and temper; and if we manage it properly, it will scarcely ever fail us. It will almost always respond to an extra call upon its powers. By proper exercise of the skin, by bathing and frictions, we may materially reduce the quantity of exercise which would otherwise be necessary to get rid of the effete material of the body. It is therefore of the greatest service to act well upon this organ in those cases where, from injury or debility of the limbs, the patient is debarred from taking the quantity of active exercise which the vigour of his other functions requires. We must then exercise the skin, causing it to throw off such an amount of matter during the inaction of the sick-room as it would do were the patient actively pursuing his accustomed avocations.

Whatever kind of bath be used *as a bath*, it will still be advisable to continue the *tepid* sponging of the morning, so long as the patient is confined to the house.

The Warm Bath.

The warm bath is quite an institution of the sick-room. It is had recourse to for so many different purposes, that it seems to be desirable to define its physiological and pathological importance and value, so as to furnish the non-professional reader, at least, with some reliable data for its use.

There are two distinct actions which the warm bath is capable of exerting upon the frame;—viz., a diaphoretic and stimulant one, and an equalising and sedative one. It is quite possible, however, and also common, to excite both of these two actions at once; for, after the stimulating effect upon the vessels of the skin, and through them, of the circulation generally, which relieves itself by free perspiration, a sedative effect succeeds, which testifies to the tranquillising and equalising operation of the function of perspiration. It will depend upon the degree of heat, and the length of immersion in the warm bath, as to which of these two effects shall predominate. The greater the heat, the more exciting will be the bath to the heart's action; and, consequently, perspiration will be promptly induced, *in some*

cases; whilst a prolonged stay in a bath of only moderate temperature proves the most certainly *sedative* in its action, and, in some states, is also the most conducive to the insensible perspiration through the skin. By a very hot bath the nerves of the skin are excited, the brain and spinal chord receive stong impressions, and sleep is accordingly banished; but by a temperature a little lower than that of the body, about 94° or 96°, the nerves are soothed, and this soothing action is reflected or conveyed to the brain and spinal chord, so as to induce a true sedative or soothing action upon the whole system. In this way, pain is allayed, convulsion subsides, irritability of mind is soothed, whilst the heart's action participates in the general calm. All this is conducive to sleep.

It will be seen, then, that before taking a warm bath, or ordering it for others, we should always ask ourselves the question, for what object do we use it?

A warm bath for the purpose of inducing perspiration, or of equalising the circulation, which has been deranged by cold or over-exertion, causing the congestion of some organ, should be of the highest temperature which will come under this denomination: this is 98° to 99°. Or we may begin at a little cooler than this, and gradually bring the bath to 99° or 100° by the addition of more hot water. At this temperature the circulation is excited for the first few minutes, the pulse generally rising several beats. After a

while, however, if the water be not kept too hot, a feeling of languor, and perhaps of faintness, creeps over the patient, which, if he be very weak, must not be too prolonged. It is needless to remark that it will be found impossible to hit this exact temperature by the mere feel of the hand; a thermometer should always be used; and as it may be had for a shilling, one should be placed in every sick-room.

If, in the second place, our object be to obtain the sedative effects of warm bathing;—to allay irritability or pain; to relax the muscles, fatigued by spasm, or by severe exercise; to induce sleep by soothing the brain through the cutaneous nerves, the temperature of the bath must be somewhat lower than the above. It may range from 92° to 98°, according to the feelings of the patient—*not of the nurse.* The period of immersion should not be too prolonged; from fifteen to twenty minutes will generally be sufficient, although in some cases of deep-seated pain, the period will have to be prolonged to half an hour, to one, or even two hours' duration.

Always cover the bath with a blanket whilst the patient remains in it. This will be especially necessary where a sitz-bath is made to do duty for an ordinary slipper-bath, as the water must be continually splashed over the upper part of the body under cover of a blanket pinned under the chin.

When a convalescent is desirous of obtaining the benefit to be derived from the warm bath, it

is essential that it be taken at such an hour of the day as will admit of its after-effects developing themselves. If perspiration be desired, the room must be kept warm, the bed also; and after the immersion, which should not extend beyond twenty minutes, he should be wrapped in warm clothing, or else go directly to bed. If the object be to allay pain, or remove the irritability and excitement of any organ, the bath may be taken at any time of the day or night, except *whilst the stomach is engaged in digestion.* Exercise after it will not be injurious; nay, will often tend to assist the sedative influence of the bath.

Beware how you use warm bathing when the pulse is very weak, fluttering, or unequal; also, when the breathing is much embarrassed by congestion of the lungs caused by disease of the heart. Not but that it may often prove useful under these circumstances; but then its operation will require to be watched by the medical attendant. If the lungs be congested from exposure to cold, or inflammatory action, then warm bathing is pretty sure to prove serviceable.

When the warm bath is taken by invalids in the morning, it should always be followed by friction over the whole surface, just as after cold or tepid bathing; if this be not done, chills will be felt later in the day, in consequence of the inactivity of the cutaneous circulation. If they proceed to the outer air after the warm bath, this friction must never be neglected.

I will recapitulate the varieties of the warm bath and their uses:—

First, the warm bath may generally be safely used to promote a diaphoretic effect—gentle or profuse sweating; by which a quantity of impure and poisonous matter is discharged from the blood, the balance of the circulation restored, and congestions of various parts of the body relieved. For these purposes the temperature of the water should be not less than 98°—in some cases a degree or two above that. The time of immersion will range from twenty to thirty minutes.

Good results will follow the use of the warm bath with the abovenamed object in view in the following cases:—After any sudden chill, or at the onset of a cold or bronchial affection; whenever a feeling of lassitude and general illness occurs; at times when epidemic diseases, especially fevers and influenza, are prevalent; after inward bruises; severe exertion either of body or mind, and prolonged exposure to cold. In the latter cases the bath should be taken at bedtime, and the best thing to do is to retire to bed immediately afterwards.

Secondly, the warm bath may be used with the same object (viz., perspiration, &c.) in view, when, during convalescence, the skin is still preternaturally hot, harsh, and unperspiring, and the patient feverish and irritable. In this case, it matters not at what time of the day it be used

(both morning and evening, for a few minutes, will answer well), so that we take the precaution of keeping the surface warm afterwards, either by means of exercise or warm clothing. The temperature here should be from 92° to 96°.

Thirdly, in all cases of convalescence from the eruptive fevers, whether in children or adults—such as smallpox, measles, scarlatina, diphtheria, and ulcerated sore-throat—warm bathing should be used *daily* until the skin recovers its normal condition. It cannot be too often reiterated in the ears of the public that it is at the *termination* of this class of disease that the infecting power is the greatest. The emanations from the skin of one person, by which outlet the disease is cast-off by the vital powers, will enter the system of any number of others who may come near to the convalescent, and so propagate specific contagion, *ad infinitum*.

Fourthly.—The second object of the warm bath (viz., its soothing and sedative effect) may be properly sought for in painful affections of any of the limbs or external parts of the body (the case of the head being left to the decision of the medical attendant), in painful affections of the liver, stomach, or bowels; whenever there is spasm, convulsion, cramp, or diarrhœa; in neuralgia and rheumatic affections; and in great nervous irritability, mental excitement, or distraction. In this class of cases, the bath may be taken at any time of the day, and may be prolonged from forty

minutes to two hours, always being followed by rest in bed.

THE HOT BATH (from 99° to 110°) is only used in the sick-room under exceptional circumstances. It is not a safe remedy in the hands of the patient, his nurse or friends, and therefore must be left to the medical adviser. It is a remedial agent of great power, for good or for evil; and as this work is written as much for the guidance of the non-medical as the medical reader, I shall not admit the subject of hot bathing, either in water or in air (as the Turkish bath), within the domain of sick-room hygiene. Some observations upon it will, however, fall under the head of 'Bathing' in the *third* part of the work.

THE COLD BATH, and cold sponging, also, scarcely come within the agenda of the sick-room. The use of the former must be very exceptional in acute disease, and both will be sufficiently dilated upon hereafter.

It is seldom, then, until the sick man has shaken off the inertia of the sick-room, and to some extent resumed his usual habits, that he will attempt cold sponging or bathing. The system remains too weak and unreactive, for some time after severe illness, to reply with sufficient energy to the application of cold. But tepid bathing and cool sponging are so powerful a means of promoting convalescence, that I consider this to be quite the proper place to discuss their use and effects.

And here I may state, *in liminè*, that it is impossible for the convalescent to *set himself* to follow with safety any of those more recondite modes of using water, warm or cold—such as packing with the wet sheet, prolonged sitz, douch, and splash baths—which compose the principal part of the paraphernalia of the hydropathic establishments.* In so far as these modes of using water, chiefly cold, are curative, it is by exciting powerful physiological actions in the system. They are by no means, like the homœopathic globules, which are too often, unfortunately, mixed up with the valuable treatment by water, mere shadows of a remedy. They are no playthings with which the nervous or the hypochondriacal may amuse the weary hours. No, they are most potent remedies; and can, therefore, only be safely administered by the skilled and observant physiologist. In the hands of the ignorant, whether in or out of the profession, the hydropathic use of cold water, by means of prolonged baths, is a two-edged sword, which may prove ruinous both to the health of the patient and to the reputation of the physician.

* How absurdly called *Hydropathy*! As if the patient were *suffering under water*!—which, by the way, he may be! It is the *cure* which is to be performed by means of the water. It should therefore have been called, as Dr. Gully has done, *Hydrotherapy*. *Then* these gentlemen would have had learning on their side, instead of having to coin a word which, if it have any meaning at all, means exactly the reverse of what its inventors intended *it to express*.

Section III.—Sponging.

The process of daily sponging with tepid water is amply sufficient to remove all that portion of the cuticular surface which has become loose and dead, together with the secretions which have become dried and entangled in it. Under daily sponging and frictions, the skin acquires a totally different aspect to that which it wears when this is neglected. From being dry, harsh, hard, and rough, it becomes as soft and glossy as velvet; a gentle moisture constantly exudes from its surface, and it puts on an elastic texture which is most pleasant to the feel.

Nor need it be feared that the increased activity which the skin assumes under this treatment will render the system more liable to take cold. On the contrary, it will be enabled to resist the changes of temperature all the more effectually, because the circulation in the skin now possesses vigour sufficient to keep up a good surface-heat.

By this daily practice of sponging and friction the organs beneath the skin are gently stimulated —the lungs, the stomach, and the intestines in particular. The friction produces a tonic effect upon the cutaneous vessels, which propagates itself to those much below the reach of the hand. The respiration thus acquires greater depth, by the exercise used in rubbing the surface warm; whilst the motion communicated to the bowels

is useful in causing them to act more forcibly upon their contents.

Supposing, then, the patient to be sufficiently advanced in convalescence to use this sponging, or the tepid sitz-bath, this is the way in which I would recommend its use. At first, the temperature should be from 82 to 88, or, in cases of great debility, 92 degrees. For sponging, have ready a large basin of water at this temperature; and as soon as the patient rises, let him divest himself of his night-clothes, and rub the surface of the body over with a soft *dry* towel, whilst seated in or upon the edge of the bed. If cold be felt, rub until the surface is again warm. Now draw on some clothing over the feet and legs, and proceed to sponge the neck, breast, and shoulders with a large sponge, or, which is better, a piece of flannel. Use a little soap at first, until the old, hard scarf-skin is all washed off, and a new soft one is formed. Then soap will be no longer necessary, and, in cases of great delicacy of the surface, may be hurtful.

A vast quantity of the *epidermis* or outer skin will come away in the first spongings, however *clean* the patient may have thought himself. After washing off the soap with some fresh water, dry the skin carefully with a *soft fluffy towel*, and then take the Turkish rubber, or coarse huckaback, for the friction. With this, *not with a brush*, rub the skin well for two or three minutes, until *every* part of it becomes quite red; then put on

the flannel vest, or other garment which is worn next the skin.

Next, the lower half of the body is to be proceeded with—the stomach, hips, legs, and feet. More rubbing will be useful now than was used to the first portion, because the circulation is slower and more feeble in the lower than in the upper parts of the body. The feet should be washed with quite warm water; nothing is ever gained by putting them into cold.

After the use of tepid water for a few mornings, its temperature should be lowered two or three degrees each day, until we come down to quite cold water; that is, not warmer than 68° or 70° in summer, and 60° in winter. So soon as the convalescent is able to use water of this temperature, he will derive additional advantages from its application to those which result from the mere removal of impurities from the skin, and assistance to its perspiratory function, and which will fall to be considered in the third part of this work. By this means the skin will be provoked to increased action, quickening the function of every organ, giving a fillip to the respiration, and through it to the digestion.

This daily sponging soon produces an improvement in the spirits, and an elevation of mind, in consequence of the effete matter, so rapidly produced in the diseased body, being thrown out of the system with increased rapidity, whereby the brain receives a healthier blood, and more of it;

and hope and energy revive, where before were only inertia and despair.

The cool and tepid slipper, or sponge-bath, may be used for this sponging whenever the patient's strength will allow of it. They are, moreover, often exceedingly grateful in hot weather to invalids who cannot take cold baths, and are also very useful in fevers and rashes.

CHAPTER VII.

CASUALTIES INCIDENT TO THE SICK-ROOM.

Fainting.

Nothing is much more alarming, for the moment, than the sudden and complete fainting-away of a sick person; and if he be much debilitated, this occurrence is not devoid of danger to life, and, at the best, generally embarrasses still more the vital functions, by causing congestion and stagnation of blood in various parts of the body. Fainting may extend from a mere momentary loss of consciousness, to such a total failure of the heart's action, as, if not speedily removed, will cause the simulated death to become real. Of course the greater the debility the greater the danger from fainting, because the rallying or reactionary powers are at a low ebb. Thus, in very weak persons, fainting frequently takes place upon suddenly assuming the erect position, either whilst in bed or in getting out to the night-chair. After very exhausting diseases, especially those which have a poisonous action upon the muscular fibre of the heart—such as fevers of all

kinds—and where there has been a great drain of fluid from the body, as in cholera, hæmorrhages, diarrhœa, large abscesses, dropsy, &c.—fainting is always to be feared if the patient be suddenly moved from a reclining to the erect posture; and it is precisely in these cases that it is likely to be of a dangerous character. Thus, a few inches of inclination in the angle which the patient makes in the bed, or couch, may make all the difference between recovery and death. The weaker the power of the heart, the more necessary will it be that the blood should have free access to, and egress from, the brain. The debilitated heart may not have power to pump the vital stream to the height of the head with sufficient force to sustain the brain's consciousness and control over the respiration.

The remedy in all cases of fainting is to lay the patient perfectly *flat* upon a hard and unyielding substance—as the floor, couch, or mattrass. It is doubtful if placing the patient's head *below* the rest of the body be advisable; certainly it is dangerous for non-medical persons to practise it. Sprinkle the face with cold water by dashing the drops forcibly against it from the hand. Open the dress at the throat and bosom, and sprinkle these also. Next put your finger as far back as possible into the patient's mouth, and hook forward the tongue and keep it so whilst you blow gently with your lips applied to his into *the lungs.* When you have done this, let another

person press the palms of his hands against the lower ribs on each side, to expel the foul air which, as in the case of drowning or suffocation, is every moment poisoning the sources of life.

The window should be open whilst this process is being gone through, and one assistant should stand at a little distance in front of the patient, and fan the air with a newspaper or large book.

As soon as attention can be applied to other things, the feet and legs should be rubbed with warm flannel, or put into mustard and water; and when the patient can swallow, *not before*, some brandy and water or sal-volatile should be given. Brandy is the better stimulant of the two, being less likely to cause vomiting, whereby the sufferer is still further exhausted.

Whenever the disposition to fainting has shown itself, be careful not to run the risk of bringing it on again by moving the patient unnecessarily: when this must be done, give him some food or stimulant, such as wine and water, or hot tea, before the move is made. This is better than first causing the mischief, and then giving the stimulants to remedy it. But it will be well to retain the prone position for days, rather than run any risk of inducing fainting by any incautious movement.

To ward off an *impending* fainting-fit, give a cup of warm tea with a teaspoonful or two of brandy in it. This acts better than plain brandy and water; the aroma of the tea carries the

brandy along with it, and thus acts immediately upon the sensorium. So, in cases of diarrhœa, or when aperient medicine has operated too powerfully, it is excellent practice to make the patient take a small cupful of tea, or beef-tea, after every evacuation. This replaces the fluid which has been drained from the system, the loss of which alone often induces fainting. Whenever it is necessary to purge a weak patient, remember this precaution, one which was much insisted upon by the late Dr. Marshall Hall.

When a patient is predisposed to fainting, it will be well to keep the temperature of the apartment a little below 60°—56° to 58°,—which may be balanced by the clothing being a little warmer. When it recurs in spite of all these precautions, lose no time in summoning the medical attendant.

Shivering

is a symptom which sometimes precedes fainting; it is frequently also the harbinger of inflammatory disease, or of some kind of fever, or of influenza. It is to be treated much in the same way as fainting. A good quantity of some warm drink should be administered—not a mere drop of brandy and water, as is often done. The patient should go to bed, have a bottle of hot water applied to the feet, and warm flannels to the stomach and armpits. If you have a bath at hand, let him take a warm one at 98° or 100° for ten minutes

before getting into bed. These precautions, taken at the *onset* of shivering, will often prevent a cold from running into a bronchitis or rheumatic fever.

If shivering be not succeeded by warmth after the lapse of a few hours, lose no more time in sending for medical aid: there is serious disease at hand.

VOMITING,

like shivering, is often the herald of serious disorders. Most children's diseases, as well as those occurring in very weak subjects, are ushered in by vomiting. At its first occurrence, it is best not to try to repress it, but to give water, warm or cold, to assist the stomach in its action. As soon as it can be borne, the recumbent position, with warmth to the feet and legs, whilst cold is applied to the head, will be advisable.

But vomiting is often a visitor to the sick-room in consequence of the patient, as soon as he has made some advance towards convalescence, committing some imprudence, either in the way of diet or exercise. Appetite frequently returns before the power of digestion, or rather in greater ratio than the latter. But it is very bad policy indeed to tax the powers of that organ too much, which, when the doctor's physic is no longer serviceable, is the only friend the sick man has to fall back upon. If there be nausea, vomiting, or pain after food, it is in every case a proof that excess has been committed either in the quality or

quantity of the food, even though the latter have not exceeded a *tablespoonful.* Reduce first the quantity. Recollect that the stomach partakes of the weakness of every other organ with which it has sympathetic connection. It is, in fact, reduced towards babyhood again; and really, milk is often the best thing for it.

Persistent vomiting often announces that the brain has become implicated in the course of the disease, therefore the medical attendant should always be informed of its occurrence. In the meantime, it will always be safe practice to give the patient little bits of ice, about the size of peas, to swallow. Mustard-poultices may be applied to the feet, and the recumbent position strictly maintained. I have known a pint or more of thin gruel, taken rapidly, put a stop to vomiting when everything else failed, probably by removing the spasmodic action of the diaphragm. Do not give sal-volatile and such irritating substances in cases of vomiting—they only increase the irritability of the stomach. A dessert-spoonful of cold milk, iced if possible, every quarter of an hour, is the best food. If this be rejected, then give it by teaspoonfuls. Broths are better avoided.

Convulsions.

Another alarming symptom, nearly allied to fainting and vomiting in its mode of causation as well as in its effects, is convulsions, or fits; a fit

being a general term for convulsions of all kinds in which the body is violently agitated or thrown into involuntary motion.

There are three kinds of fit,—viz., the true convulsions (such as seize children, and which may occur to adults in the course of many diseases), hysterical fits, and epileptic fits. The two former often complicate the affairs of the sick-room; the last is a distinct disease, out of the province of ordinary nursing.

The importance of convulsions must be estimated chiefly with reference to the youth and constitution of the patient; and secondly, to the diseases in which they occur. By the nurse the former is the light in which they must be viewed. There is always danger in every convulsive attack, and not the less because they have occurred before, although people get to fear them less from seeing them often recovered from.

When a convulsion occurs in the case of a child previously in good health, it is ten to one but it is owing to the irritation of teething, or else of some indigestible matter in the stomach and bowels. If it be caused by teething, the fact will discover itself by increased heat and swelling of the gums; the child will be continually putting its finger or some hard substance into its mouth to rub them with. A crimson spot will appear on the cheek of the affected side, though sometimes the countenance is deadly pale. If the stomach or bowels be in fault, there will be attempts to vomit; the skin

will become cold and clammy, and the features pale; and the child draws up its legs towards the chest, thrusting them forcibly out again, and continuing for a long time restless and cross.

The warm bath is the popular remedy for every kind of fit, at least in children, whatever may be the cause of it. Here it is that a *little* knowledge is *not* a good thing, inasmuch as the use of this universal remedy tends to draw the attention away from more important indications. The moment the child is seized with convulsions the warm bath is got ready, and the child plunged into it without reference to the cause, or other remedy proper for them. It need scarcely be said that this remedy, being a powerful one, where it does no good is sure to do much harm; indeed, it is probable that more harm than good is done by its use *during* the fit. Moreover, the few minutes in which the child is kept in the water has the effect of stimulating the circulation in place of calming it, and of *exciting* the brain and nerves instead of soothing them. If the bath is to do good by its soothing effect, it should be prolonged much beyond the ordinary period to which it is generally extended.

For the first few minutes the effect of the warm bath at 98° is exciting. If there be a tendency of blood to the head, therefore, as there generally is in convulsions, this will be increased instead of relieved by hot water. The fit will in general be over before the second or soothing effect is

produced, and thus we are led to neglect other remedies, which may be of immediate service, for this which will keep.

A better plan to adopt during the fit is the following:—Place the child, or other person, flat upon the couch, or bed, and proceed as directed under 'Fainting.' Loosen the clothes, sprinkle cold water upon the face and chest, apply heat to the feet or mustard-poultices to the legs, and pull the tongue well forward by means of a spoon whenever one can be got into the mouth. If suffocation appear imminent, breathe into the mouth as directed under 'Fainting,' and *gently* press out the air again from the lungs. This manœuvre is to be continued until the patient breathes again regularly and easily.

It is *previous* to the access of the fit that the warm bath would be most serviceable, at least in children. It would then soothe the restlessness and irritation caused by the swollen gums, or by the painful stomach, and prepare the way for other remedies. A gentle emetic should be given, to cleanse the stomach of any offending substance; and then an aperient, such as a dose of castor-oil or Gregory's powder, and with the aperient one drop of laudanum for every year of the child's age.

When convulsions occur in adults, they are much more formidable than in children: they generally indicate that the brain has become affected. As has been stated in regard to

children, the warm bath is of very doubtful service during the fit. Rather apply cold to the head, hot bottles or mustard-plasters to the feet and legs, and when there is an absolute attempt at vomiting give a dessert-spoonful of flour of mustard in warm water the moment the patient is able to swallow.

Whenever any symptoms of a convulsive nature have shown themselves, either in the case of a child or adult, the food must be of the mildest farinaceous character, and all stimulants rigidly withheld until sanctioned by the medical attendant.

Delirium.

The next complication in this connection is delirium. Delirium is not caused, like fainting, by the circulation of too small a quantity of blood in the head, but either by over-excitement of the brain, or by the blood containing some poisonous material which disturbs the intellectual functions.

Delirium is of two sorts, active and passive. The first kind occurs when the brain is highly excited by inflammation or fever. The flow of blood to the head is then morbidly increased, and the thoughts acquire an increase of force and rapidity, and they become confused owing to the inability of the labouring mind to control its own operations. The patient talks in a loud tone, and with rapid utterance; he argues, he threatens, or

fights with some imaginary assailant. In children and females, screams are added to these outbreaks of violence; and then it is imagined, wrongly, that the unfortunate patient must be suffering intense pain.

It is not likely that delirium of this kind will fall to be treated by the nurse without the aid of the physician, because everyone is aware of the dangerous state of the patient in this, the acute stage of delirium. Nevertheless, it may arise when medical aid is not at hand. I have seen such terrible consequences result from not restraining a patient under these circumstances:—a female throw herself from a three-story-high window, a man rise and cut his throat with his razor, and a third almost kill his wife under the insane impression that she was going to kill him —that I do not hesitate to recommend the friends of patients in high delirium, particularly when they attempt to get out of bed, to use firm but necessary restraint. The arms are to be tightly bound down to the sides by enveloping the trunk in a sheet, or large towel; or the wrists may be fastened to the side-pieces of the bed by means of strong towels or handkerchiefs; the feet being confined at the ankles, and the knees tied together also. If a strait-waistcoat can be got at, that is the proper thing to be used. Children and feeble women may be restrained by drawing the sleeves of the nightgown beyond the hands, and tying them tightly together over the chest, the

knees and ankles being confined by silk handkerchiefs passed round them.

Some people have a horror of seeing a beloved object thus manacled. But, let them depend upon it, it is the best thing, and the kindest that can be done. They are afraid lest the restraint should still further excite the already over-excited brain. But this is false reasoning. The action going on in the brain is the same whether the patient fight against the restraint, or against the imaginary impediments to his free motion which the disordered mind conjures up. Is it not better that he should exhaust himself thus, than knock himself to pieces against the bed-posts, or rise and do himself or others some fatal injury?

In all cases of active delirium, keep the feet warm, apply ice, or, if that is not to be obtained, towels folded and wrung out of the coldest water to the head, in quick succession. The water may be made still colder by the addition to it of any of the so-called freezing mixtures. The following are easily procurable, and easy to use:—Sal-ammoniac pounded and saltpetre, of each five ounces to every pint of water. This will lower the temperature of water from 50° to 10°, or 22° below the freezing-point of water. A smaller portion of the salts will do in common cases, when the fall in temperature will not be so great. But the artificial ice, made by the full proportions of the salts, will serve to cool a large quantity of other water.

Another freezing salt is nitrate of ammonia, which, however, is not so commonly procurable as the two former. Equal parts of this salt and water makes an icy mixture as low in temperature as 4°, or 28° below the freezing-point of water. These freezing mixtures may be put into an oil-skin or gutta-percha bag, or tied into a bladder, and then they will be as safe and convenient to use as ice.

In the second kind of delirium—the low muttering, or passive delirium of fevers and other exhausting diseases—the scene is more like a disturbed dream expressed aloud. Bathing the head with vinegar and water (one part of the former to five or six of the latter), or the temples with eau-de-cologne, or a mustard-plaster to the nape of the neck, will be all that the nurse need do. Sometimes there are feeble attempts to get out of bed in this kind of delirium, but they are easily restrainable even by a woman.

In every case of delirium, cold or cool sponging of the body will be found a most beneficial agent. It refreshes and soothes the system, whilst it gives improved tone to the nerves, which reacts favourably upon the brain.

Before dismissing the subject of delirium, it may be well to caution timid wives and relatives, and all whom it may concern, against the notion that whatever a patient may utter in the state of delirium must necessarily have occupied his waking thoughts. It is thought that the poor

sufferer, in the vagaries of the half-poisoned brain, goes over again scenes in which he has once been an actor, and thus jealousies and heart-burnings arise from what is but the chimera of a disturbed dream. In fact, we must look to dreaming for the analogue of delirium. The fantastic shapes and scenes, having no reference to living reality, through which the inveterate dreamer goes, are reproduced in delirium; and the apparent earnestness of the poor raver, instead of its being taken as a proof of the connection between his madness and his sanity, is only an evidence of the extent to which his ideas have wandered away from their every-day channel through the perverting influence of disordered blood. If any wife be disposed to make herself uneasy at the 'wild expressions' of her delirious husband, or the contrary; if any parent or minister of religion be shocked at the depravity of the sentiments uttered by their children, or the members of their flock, let them remember that the mind is turned, as it were, upside down; and that the *very opposite* of the natural disposition may exhibit itself in the ravings of delirium. Just so is it with people under chloroform. Ladies of the purest mind have been known to utter words or use actions the very contrary of their proper and usual habits of thought. It is, indeed, true that no expression can come out of the mouth the type or root of which has not had some habitation *in the mind*; but who is so fortunate—innocent

child or modest matron—as not to have seen or heard that which, although it may not have remained long enough to taint, has nevertheless left its mark upon the impressionable mind?

Delirium, then, is dreaming—nothing more. Seldom referring to actual scenes, the action of the dream is a compound of various pre-existing ideas, so jumbled up together as to have none of the rational or necessary connection in their association which gives to our waking thoughts their sanity. It can, then, be only called a temporary madness.

Therefore it would be both wrong and unjust to judge anyone, man, woman, or child, by the ravings of delirium. Whatever is so heard should be at once dismissed form the mind, buried in oblivion, as so much 'sound and fury, signifying nothing.'

Incapacity to Pass Urine.

In the course of debilitating diseases, fevers, &c., when the patient lies inert and somnolent, and scarcely conscious, the power to pass water is sometimes lost. It is necessary that the nurse should have a watchful eye to this condition of the patient, as otherwise much injury will result. Whenever twelve hours have passed without the bladder being relieved, the medical attendant ought to be informed of the circumstance. Sitting upon warm water, sometimes the application of a towel wrung out of cold water, will excite this organ to

action; but give no medicines for this casualty without the knowledge of the doctor.

Hæmorrhage.

The passage of blood upwards from the stomach will generally be marked by a black, coffee-ground-looking substance in the matters which are vomited. This sometimes occurs in the course of low fevers, as typhus; and in bad cases of the eruptive fevers, such as small-pox. It may, however, mark the rapidly impending fatal termination of any disease, and is always of the most serious import.

Bright crimson blood, or streaks of the same accompanying the expectoration, is generally an indication that the blood comes from the lungs. In consumption this is a common symptom, and it also occurs occasionally in bronchial diseases.

Until the arrival of a medical man, you may administer ice in small lumps, swallowed at once, so as to melt in the stomach, or a little vinegar and water, or lemon-juice. Cold to that part of the spine opposite to the stomach will sometimes arrest hæmorrhage. The patient should be kept perfectly quiet, cool, and with the head and shoulders well raised.

Burns and Scalds.

As these accidents seldom occur in the sick-room to the patient, although they readily may to the be-crinolined attendants, nothing more need be said than that the best application for an accidental scald with hot water, or a slight burn, is to wrap the part in cotton-wool or flour, and bind it tightly round with some material which will exclude the air.

Death.

Death, being one of the natural terminations of all disease, can scarcely be looked upon as a casualty; yet its occurrence is sometimes so sudden and unexpected that the symptoms which threaten it should be well known to those who have the charge of a sick person, and to professional nurses especially.

The aspect of death itself is known to most, except the very young; nevertheless, bystanders are frequently at a loss to know whether it have really taken place or not.

The approach of death, when not hastened by bad management, or by the sudden default of any of the great organs—the brain, lungs, or heart—is more or less gradual, and its indications well marked. Perhaps the most noticeable of these are the *falling-down* of the features, by which the natural expression is completely changed.

The eyes become glassy, the eyelids drooping, half-closed, upon the balls; a cold perspiration stands in drops upon the forehead and chin; and although sometimes the face is suffused with a deep dusky purple hue, it is generally of a muddy pallor, which also pervades the hue of the skin generally. The breathing is generally rapid and catching, but sometimes very slow. The breath appears to come from the upper part of the chest only; but in some cases there is scarcely any movement of the chest, the diaphragm performing the whole of the respiratory movements, whilst the nostrils dilate and flap at every breath. Towards the end, the mucus, which has been for some time collecting in the bronchial tubes, now rattles as every breath is drawn through it, and becomes very troublesome to the patient. The act of swallowing is much affected, and is performed with difficulty; liquids being taken in single gulps instead of the former continuous swallowing.

The pulse is generally feeble and indistinct, or altogether imperceptible at the wrist. If the ear be applied to the heart, it distinguishes only a distant, feeble, confused sound. But in a small class of cases—apoplexy, for example—the pulse often remains strong and jerking until within a few minutes of death.

Whilst all this is going on, the body begins to cool rapidly, the feet and lower limbs first. A *cold clammy sweat* bedews the whole of its surface,

sometimes to an excessive degree; whilst the sufferer lies supine, with limbs outstretched, and the hands beating the bed or the air, or wandering in search of something to hold. The picking at small knots or threads upon the bed-clothes is a well-known symptom of impending dissolution.

Sometimes there is great restlessness—tossing of the head to and fro on the pillow, beating of the bed with the hands, or stretching them out repeatedly as if in search of help.

A few deep respirations, longer and longer between, the glazing eye, and the perfect immobility of the body, bespeak that the end has come. A final prolonged expiration, accompanied by a kind of general shudder, often takes place a few seconds after what appeared to have been the last breath. This seems to be occasioned by the resiliency of the ribs falling in upon the now collapsed lungs.

The approach of real death is to be distinguished from its counterfeit, fainting, by the suddenness of the latter. The breath is almost entirely suspended in fainting; and the bloodlessness and paleness of the countenance is different to the dusky hue of death. The body also remains warm during transitory faintings, although the circulation may be almost suspended.

But fainting may pass into death, and therefore must be watched during illness with the utmost anxiety.

The euthanasia, or comfortable and gentle pas-

sage from life to death, ought not to be beneath the care either of the physician or of the nurse. When medical science has done its utmost, and failed, it is not too much for it to condescend to smooth the road, and ease the passage into the dark valley into which the patient is entering.

A proper position of the body is one of these. There should be a gentle incline from the loins to the top of the head, the pillows being supported and kept even by the horsehair squab or pillow of a sofa placed beneath them. The back of the head should be raised about an inch, by the pillow being pressed in under it. In this way the patient will breathe more easily than in any other manner. The lips must be constantly moistened with *cold water*, acid or spirituous things only increasing their dryness. The air of the room should be kept fresh, whilst an attendant fans it gently as it is drawn in by the patient. There should be no strong-smelling perfume, such as pastils, &c., in the room, as the senses of a dying person are sometimes unusually acute.

Well-meaning but ignorant people often annoy a dying person by continually pressing food, drink, or medicine upon him. Surely this is unkind? A dying person is aware of his condition, and wants not nourishment nor medicine. But a stimulant may be given when it is important to rouse the sufferer to some last effort, such as that of signing a will, or of receiving the Holy Communion. Fidgeting about the bed annoys a

dying patient, and disturbs his thoughts from the course which, if a little suggestion be given, they are almost sure to take. Frantic prayers by the bystanders are equally out of place. If they believe that, at such a moment, they can be of any avail at the Throne of Grace, let them by all means be made in another room. If not, a few cheering words from the Promise of Life will be kinder, and surely more becoming Christians, who are not left without hope in this dark hour.

In a few minutes after the last breath has been drawn, place the limbs decently by the side of the trunk in a straight line; then press down the eyelids over the eyes, and leave the attendant angel to receive the struggling soul from the severed chains of its earthly tabernacle!

PART III.

THE RESTORATION OF HEALTH.

CHAPTER I.

CHARACTERISTICS OF CONVALESCENCE.

It has been already stated that that compound of actions which we include under the term disease, involves a large proportion of curative or restorative processes. Nature makes an effort to place her functions in the position they held previous to the operation of those disturbing influences which have thrown them *out of gear*. This effort—this natural tendency of some functions to remedy the ill caused by the perverse operation of others—represents the nearest approach, to my mind, to a clear idea of what is called the *vix medicatrix naturæ*: in plain English, the power which the body possesses to right itself when it has gone wrong.

It will be readily believed, then, that just in proportion to the efficient operation of this *vis*

restituens or curative force, will convalescence from any disease prove slow or quick, imperfect or complete.

Of course it will be understood that the original powers of the body, this last-mentioned amongst the rest, suffer diminution as life proceeds; slow and inappreciable perhaps, but nevertheless actual and progressive. This restorative force, whose existence no physiologist denies, however differently each may define his idea of it, varies in its power, both to resist the assaults and to remedy the ravages of disease, according to the original amount of vital force possessed by each individual constitution. Some individuals may be said to *live* more completely than others; their organisation is finer, the mechanism of their organs more delicate and minute. Such persons both feel disease more, and resist it more vigorously when attacked by it, than others of coarser mould.

Nevertheless, there comes a time to us all (generally somewhere about, or soon after, the middle period of life), when, however great the resisting powers may have been, disease is not so quickly or so completely recovered from as formerly. Instead of quickly recovering all his wonted elasticity of frame, or vigour of mind, the invalid remains for some time in an intermediate state—neither ill, nor yet quite well. There is something which he cannot shake off. He thinks it is a remnant of the disease, something left behind; and he is for putting in another ferret, in the shape *of physic, to drive* out this last lingering rat.

But this is false reasoning, because the supposed facts upon which it is founded are no facts. The character of his functions may be healthy; there may be no materials left of a morbid character; but the functions are languid in their play, and vital force is eliminated from them with less energy than before. Hence the languor which oppresses the limbs, and the dulness which obscures the intellect. The body may answer to its natural stimuli—air, heat, food, exercise—but not so cheerfully, nor with the accustomed reciprocity and mutual adjustment.

Subsequent attacks of illness are followed by still greater changes, until at last these *vestiges*, or footprints of disease, remain indelibly impressed upon the organism. We can now no longer hope to be rid of our enemy—the settled cough, the rheumatic or gouty limb, the feeble and irritable heart, the stomach whose digestive powers are seriously reduced. We are, in fact, both absolutely and relatively put down lower in the constitutional scale, and become a permanent invalid.

The means of removing this enfeebled condition of our organs, however slowly that removal may be effected, now becomes the subject of our anxious consideration. Even should removal be impracticable, there is *something* to be done. We may try to keep matters in *statu quo*; and prevent the present bearable condition of the

system from still further degenerating into one utterly unbearable and hopeless.

Even this latter is a *good* by many to be sedulously sought after.

It is in this description of case, when the practised eye of the experienced observer discerns that the patient's condition scarcely admits of amendment, still less of cure, and his honest tongue tells the patient that to prevent getting worse must be his chief care, that the quack and the charlatan of every grade steps in to hold up delusive hopes before the jaundiced vision of the *unresigned* sufferer.

No doubt, it is hard for one lying prostrate on the bed of sickness to contemplate with serenity of mind the time, perhaps fast approaching, when this earthly tabernacle must be dissolved, and all the ties of hope and joy snapped asunder. But it is almost harder for one in the condition to which I have just referred, to believe that he is *not* curable by *some* means or by *some* person. If his desire for life and health have got ahead of his reason, on account of his ignorance or want of faith in the teachings of science, then will he who bids the highest for the patronage of the valetudinarian be the most favoured physician. If he promise life and health by the means of some potent elixir, some wonderful life pills, or by some curious and unusual process or manipulation, he will obtain credit for his nostrums just *in proportion* to the audacity of his assertions,

and the novelty of the performances by which he pretends to cure. Novelty above all! Something untried, and hitherto unheard-of, will, in spite of all the rules of logic, of all sound experience, be the favourite '*cure*' for the moment with this class of persons; just because everything *else* has been tried and failed, and this has not. With such people, '*Omne ignotum pro mirifico*' and '*Omne mirificum pro beneficio*' are convertible terms. Every unknown thing is, *for them*, a miracle; and every miracle *must* work a cure. Thus will charlatanry and imposture thrive so long as medicine is less than a science of demonstration, and so long as the characteristic of the education of the great majority of persons is total absence of all knowledge of the natural sciences, and of that which relates to the functions of their own bodies and their own minds in particular.

Could those people whose money goes to fill the pockets of the host of advertising quacks, *in* and *out* of the profession, be only induced to listen to an explanation of the very principles of disordered action, or make themselves acquainted, however slightly, with the manner in which natural causes act upon their bodies in health as well as in disease, much of the quack's harvest would remain unreaped. If they would only believe that disease, to be recovered from, must necessarily be a restorative process; that the high fever, the profuse sweats, the violent cough, the beating heart, are only so many uprisings of the

vital powers to eject the unnatural invader from the system, which are to be followed by quieter but not less useful efforts, by which those functions which have gone astray are to be brought back into the proper track.

They should recollect too, because it can easily be understood, that just in proportion to the commotion which has been excited in the system by the violent assaults of the enemy, will be the depth of the exhaustion by which the struggle will be followed, and the slowness and painful elaboration of the restorative processes.

Nor is this position affected by the apparently rapid convalescence from various diseases, such as many epidemic and contagious disorders. There may *to all appearance* be a rapid recovery from the very lowest point; but the recovery is only apparent—it is not complete. Every medical man knows the critical state in which the system remains after any of this class of diseases, and how readily it succumbs to some new invader; whilst a permanent deterioration of the constitution is the almost invariable consequence.

It stands to reason also, that an originally defective constitution, or a frame weakened by previous disease, or intemperance, will have a much smaller chance of making a perfect recovery than one more happily situated; and that there must come a time when complete repair of the injuries received from disease is no longer possible.

To accept a lower position, a reduced status in the ranks of health, as a *fait accompli*, is, under these circumstances, the wisest course. To tamper with the debilitated vital machinery by drugs ignorantly chosen or rashly administered, is madness; whilst to try to hasten what reparation is still possible by specious and unnatural appliances, or by calling upon the enfeebled frame for extra exertion to cast off its lethargy, is to destroy the powers which are still on our side, and to throw away the valuable time which should be given up to a careful nursing and husbanding of the remaining powers of life. It is true philosophy to know how both to grow old and to grow invalid with composure.

There is a very essential difference between the operation of different classes of disease, which the invalid ought to understand. Some of them are essentially rapid and acute in their nature; they come on suddenly, affect the system profoundly, and depart as quickly as they came. This is the case with what are called *zymotic* diseases, which are caused by the entrance of a poison into the body which creates there a kind of ferment. These poisons are of such a destructive nature that their prolonged stay would be certainly fatal. All the forces of the organism, therefore, arouse themselves simultaneously to repel the invader, and eject him from the system, as a night guard on duty quickly passes the signal of danger on to the others, to inform them of the sudden attack

upon the garrison, until every sword and bayonet is quickly seized to drive out the assailants. If the little garrison prove unequal to cope with the invading forces, or if they have been remiss in arousing themselves until the enemy has effected a lodgment in force within the ramparts, they are sure to be defeated, and fall an easy prey to the enemy, whose emblem is *death*. If, on the other hand, the vital powers are actively on the alert, and in sufficient force, they are able not only to repel the enemy, after a fierce conflict it may be, but they get thoroughly rid of him; not a trace of his assault being visible on the scene of the onslaught.

Seldom, however, is this dislodgment effected so completely and effectually as to leave behind no trace of the fierce struggle. There are wounds, and scars, and crippled limbs, to testify to the severity of the contest, and to the dangers which the courageous defenders have passed through. Thus the lungs often remain permanently damaged after measles or small-pox; the kidneys after scarlatina; the stomach and bowels after fever; and the heart after rheumatism.

And when these vestiges—these *remanents* of disease, still linger on, do not try to dislodge them by the same vigorous onslaughts as you made to repel the first assault of the enemy. The garrison is fatigued, wounded, and quite unable to resume such powerful efforts for a long while to come. *It requires* rest and food to recruit its strength.

The wise practitioner will always regard such cases in this light; he will be content to work out all traces of the recent disease by slow and mild measures. He will endeavour to remove exhaustion by gentle supplies; and by not making greater call upon the vital powers than they can well respond to. The steady increment of health, so gained, almost inappreciable it may be, from day to day, will be the best reward of his patience. Little by little the fabric will be rebuilt, the functions resume their natural order of play; and in a longer or shorter period, according to the youth and vigour of the constitution, the organism resumes the aspect which it possessed before any assault was made upon it.

But *chronic* diseases are quite different, both in their mode of attack and in their mode of cure. Arising by slow, and, perhaps, to the patient, unperceived steps, within the system itself, they are generally the result of long-continued opposition to some of the dictates of nature, to her laws of health. Errors in diet or regimen; or in exercise and business; or some hereditary or latent taint which these errors have brought into activity; or adverse influences of climate, air, or occupation, have been acting through long months or years before the final result is made manifest. There has been going on a long, silent, almost unperceived battle between these insidious enemies and the guardians of health. The powers of the latter, however, are finite, whilst those of

the former are practically infinite, and the weaker succumbs at last.

Many warnings, many threatenings to retire from the contest, may have been given to the reasoning powers, but they are too often unheeded, or action upon them is postponed until it be too late. The garrison has to surrender, but it will not yield until there is no sound bastion remaining under which to seek shelter from the enemy's darts—no loophole through which defence may be continued.

How can rapid recovery be expected in such a case as this? The enemy may have desisted from his assaults, but only after he has rifled all the resources of the place; carried away the remaining part of the garrison, leaving it a mere skeleton—a shell without life or soul.

Now, when the few remains of vitality left in the system after a lengthened struggle, such as I have endeavoured to depict, rise from the dust into which the enemy has trodden them, they are found to be enfeebled to the last degree. No work can be expected of them for a long while, except such as is actually necessary for their own existence. The effect of causes which have been long in operation cannot be removed in a day. The longer the time in which they have been undermining the constitution, the more complete will probably be the wreck they will make of it, and the more slow must be the possible recovery, *and the fainter* our hopes of attaining it.

The philosophy of these remarks is, that not only is there *folly* in hoping for miracles from medicine to work the speedy recovery from old-standing ailments, but there is *danger* also. Rashness and undue calls upon the powers of the system are here highly to be deprecated, for the reasons just stated; and the well-meant but foolish attempts to expedite matters may be followed by total and irremediable failure.

The condition here indicated will be best recovered from by a steady persistence in a carefully and judiciously chosen *restorative system*; by bringing all the ordinary means by which health is preserved or regained to bear in *proper* force upon the debilitated system, so as to *re-create* its structure; and during this delicate process all circumstances adverse to health should be most carefully avoided. A proper temperature; the best air; the most suitable food; gentle and easy exercise for the body, and more or less complete relaxation of mind, with the unremitting exercise of cleanliness of the skin, must form the groundwork of our proceeding, whatever recondite or wonder-working drugs we may exhibit along with them.

The convalescent should not be ashamed of believing himself put back several degrees in the scale of human organisation. He is no longer the highly-placed animal he formerly was; he has descended lower in manhood. He has retrograded

towards childhood, and must have a child's nursing, a child's food, and a child's exercise.

The acceptance of these unpleasant facts will, perhaps, involve a higher degree of patience, humility, and resignation, than is generally met with. In many cases, indeed, these virtues are, unfortunately, practically ignored. The busy merchant wants to get back to his counting-house. The temperature, he says, will be all right, and *of course he* can manage his diet and exercise. Yes. But does he not intend to work his brain as heretofore? So the professional man. He must see his patients, or his clients. They are worrying him; they won't wait; but he will only do a *little*. Whilst the chances are that we shall find these men not only doing their former amount of brain-work, but actually trying to fetch up arrears!

These are the things which make convalescence so notoriously incomplete; that leave those *vestiges* of disease behind to grow into new *germs*, which, together, make the opprobrium of the medical art, whilst, in reality, they are only a monument to the avarice or folly of the patient.

CHAPTER II.

DIET OF THE INVALID AND CONVALESCENT.

Section I.—Choice and Preparation of Food.

The greatest difficulties which an invalid, or a person convalescing from severe or protracted disease, has to encounter are to be found in the want of balance between the demands of the system on the one hand, and the powers of digestion on the other. During the course of most acute diseases great waste of the body takes place. Even a common cold leaves a void—a feeling of emptiness, and craving for fresh supplies. But, unfortunately, the stomach partakes of the debility which oppresses the other organs, whether it have been itself affected or not.

The digestive organs having suffered loss of power, it will be necessary to adapt the supplies which are furnished to them to their enfeebled condition, as regards the absolute *quantity*, the *quality*, and the *mode* of taking the food, in order that they may not be over-burdened with too much work at one time. Our object is to get

nourishment into the system as quickly as possible, and this object will be generally best attained by giving smaller quantities at a time, and more frequently repeated, than was the habit in health. In this way the stomach may be induced to tolerate a large quantity in the whole; whilst, were it to be called upon to digest a heavy meal at once, it would prove to be quite unequal to the task.

Moreover, the feebleness of the digestive organs, which, after severe illness, approach very nearly to the condition of advanced age, requires that we should save them all the exertion in converting a meal into nourishment, which lies in our power. The operations performed by the stomach upon the food are two — the *one*, the disintegration and reduction of the food to a pulpy mass; and the *other*, its conversion into chyme, through the influence of the gastric juice. If we can save it any of this work, we shall also save, *pro tanto*, the expenditure of its vital energies.

Now, the secretion of the gastric juice is the peculiar function of the stomach; and the conversion of aliment into chyme, or the first portion of digestion, can only be properly performed in that organ. But we may assist very much in the way of *reducing* the food to a pulpy mass so as readily to permit the gastric juice to penetrate into every portion of it.

Hence the utility of comminuting solid food into very small portions, and masticating them *with extra care*. There is great danger of the

invalid, whose jaws are weak, bolting his food without sufficient mastication, whereby it escapes the action of the saliva of the mouth. Minced meat, served with thick gravy or sauce, is open to this objection, and should never be given to an invalid unless it have been stewed so long as readily to fall into shreds. If the patient be too weak to chew his food, this precaution in the cooking of it must be borne in mind.

Meat may be pounded and reduced to a complete pulp before it is given to persons with a very weak stomach, for it is the separating the hard fibres of animal food from each other which taxes its powers more than the digesting of it. Stews, carefully made by slow boiling for several hours, the fat being carefully skimmed off, with a little of some soft fibred vegetable, such as young carrots, turnips, &c., are a most grateful and appetising dish to an enervated stomach. But then they must be well *made*. The meat should be chopped fine before being put into the stew-pan, and then a less time will be required for the operation.

Warmth and spices, by stimulating the glands of the mouth, assist very much in exciting a flow of saliva, which, being swallowed with the food, is a great help to digestion. What sick person has not felt the dry tongue sticking to the clammy mouth, and covered with a brown fur, which effectually closes up the orifices of its pupillæ, thus depriving him from perceiving the fragrancy

and savour of the food? Spices are here of especial service, if used with moderation. They are further useful when they reach the stomach, by exciting the same kind of action there as in the mouth—viz. an increase of its secretion of gastric juice.

Now, cold food, cold meat, bread and butter, are deficient in their stimulating quality, and are therefore instinctively disliked by the sick. Hot toasted bread for breakfast, with a bit of chop nicely peppered, will often digest when plain bread and butter, with tea or coffee, remains for hours in the stomach.

But it must be remembered that there is a great difference between condiments, such as salt, pepper, and other spices, and such substances as are preserved to be used as a *relish*; such as pickles, anchovies, olives, cured fish, and the like. These last, along with the spices, contain an amount of hard and indigestible fibre, which is about the worst thing that can be put into a weak stomach. Thus a person who might be induced to digest a good meal of chicken or game, with the assistance of a good bread sauce with a little cayenne in it, might die from eating pickled walnuts with his chop, or anchovy with his toast at breakfast.

Take care, then, in giving stimulating spices, to assist in the digestion of the food, that they occupy but the smallest compass, and be such, indeed, as shall require no digestion at all.

The fact that the stomach is debilitated after

disease, and generally in ill-health, points to another caution with respect to the preparation of food. It should be divested, as much as possible, of all those portions which are more difficult of digestion than the rest, or which, by their bulk, take up much room in the stomach, tending to irritate it by their presence. Such are all bony, gristly, and stringy parts of meat; poultry when too old; and meat too much or too little done. Here, again, minute comminution and stewing are of the greatest use.

Of vegetable food, select the tenderest, which is generally the youngest, and such as can be easily reduced to a pulp. Young cabbages, being stringy, are inadmissible; whilst young carrots and turnips, having less woody fibre in them than those that are mature, are to be preferred to them. Cauliflower and broccoli freed from all stringy and leafy parts, artichokes and peas, will answer the requirement, as also well-refined and well-cooked potatoes.

Of meats, choose the *best*; and the best animal food is that from a *mature* animal, well-fed, and of the best quality. The lean of fat meat is already half dissected by the fat globules which are everywhere intermingled with the lean fibre. Let it be hung just sufficiently long for the stiffness of death to have passed away, and until a slight tenderness to the touch has arrived, but entirely *short* of the slightest touch of taint or putrefaction. White meats, such as veal, lamb,

and poultry, do not improve by hanging, and, if tainted in the least degree, are utterly unfit for food. Artificial ripeness may be given to mutton, hams, &c., by burying them in brown sugar for a week or more. A leg of good mutton buried for three weeks in a cask of sugar is fit for the table of an epicure.

Section II.—Animal and Vegetable Food.

The selection of animal and vegetable food respectively by an invalid is a subject of great importance, and one by no means to be decided by the rough-and-ready chemistry which the disciples of Mr. Banting are so rashly applying to their digestive laboratory.

It is not here a question as to how much nitrogen may be contained in this or that article of diet; or how much waste of substance it will restore; or how much muscle it will make to replace fat removed. These theorists forget that all the usual articles of food—flesh, bread, potatoes—possess ample store of nitrogen for all the wants of the body, and, if moderation be observed, none too much; whilst if no more fat, starch, or sugar than is mingled in the composition of these articles, or which is necessary to make them relish, be eaten, the system will not become oppressed with those masses of fat which *nine times out of ten* are the direct result of *over-eating*. The true Bantingism lies in moderation

in supplies, not in excluding from the ordinary diet any one or more of those articles which, when taken in excess, go to form useless masses of fat, but which, taken in the proper, normal, and instinctive proportion, are as useful, and even essential, to the well-being of the system as the most highly nitrogenised substances.

Again, the term *chemical food*, as applied to fat, sugar, starch, &c., is altogether a misnomer, if it is meant to be used in contradistinction to *vital* food; because some portion of every kind of food, probably, goes to the nutrition of the body, and only when they have become effete and worn out does the system part with the materials which it has once adopted into the structure of its frame. There is no proof that any part of the food answers *no other* purpose than to feed a fire ever going on in the blood wherewith to warm the body. That carbonaceous food answers the purpose of the generating animal heat better than nitrogenous—that is to say, that oil, fat, sugar, starch, are more useful in this particular direction than bread, flesh, eggs, &c.—may be true; but that they have no other office than that of directly maintaining animal heat, is what physiology has not yet proved. Hence, also, it follows that we shall be equally wrong to deprive ourselves altogether of fat, sugar, and starch, because there is a tendency in the system (generally from lazy indulgent habits) to lay by a certain quantity of these substances in useless layers of fat under the skin. Unless it

can be proved that, before fat is thus stored away, it does *not* perform any useful office in the economy, we can only look upon the principles of Bantingism (which, by the way, are as old as the hills) as *upon their trial*—a trial made, in many instances, doubtless, at the serious cost of those who present their *corpora vila* for experiment.

Obesity.—After all, it is the excess of supply in proportion to waste which causes obesity—eating and drinking the rations of a thresher, whilst undergoing the labour only of a Bond Street beau. 'Live upon sixpence a day, and earn it,' was the direction of Abernethy to one who asked him for a recipe against getting fat. And 'keep your eyes and ears open,' i.e. an active mind, 'and your mouth shut,' i.e. a temperate diet, will answer equally well.

Importance of Easy Digestibility.—The party which the *invalid* has *first* to consult is his clerk of the works, his director-general of the kitchen —the stomach. He must choose his food with reference to its *digestibility* rather than to its nutritive properties. As I have already observed, all the great articles of ordinary diet are sufficiently nutritious if only they can be properly digested. But if they cannot, then 'turbot, venison, and woodcock,' the 'dinner for an emperor,' will be useless, even poisonous, to him. For rich albuminous food, if not digested when *it* reaches the stomach, speedily runs into inci-

pient putrefaction, and then it excites the most dangerous irritation throughout the whole track of the digestive canal. Some of the most distressing attacks of gastralgia, or neuralgia of the stomach, and of painful diarrhœa, which I have ever witnessed, were caused by imprudently taking highly azotised—that is, nitrogenous—food before the stomach was in a condition to digest it. In such a case, there is nothing for it but for the stomach, with painful efforts, to force the offending mass through the pyloric opening into the bowels; where, being crude and undigested, it speedily sets up violent spasmodic efforts at expulsion, for which diarrhœa is necessary. The injury to the coats of the stomach and intestines so caused, remains for a length of time a painful record of over-haste to be well.

It will, therefore, be a good plan for the invalid and convalescent to observe a rule which was laid down for sick-room diet; viz. in any case where he has reason to doubt his ability to digest what he desires to take, or even what the stage of his convalescence seems to demand, to use a diet a little in *arrear* of his condition—less nitrogenous food, and more farinaceous. Then, step by step, he may proceed to mingle more and more of the former with the latter. Another good plan is to take the strongest part of the diet, as the animal part of it, in an already half-digested form, as beef-tea, or well-stewed or pounded meat or poultry. Fish is an inter-

mediate diet, a kind of half-way house between animal and vegetable food, which might be much more largely used than it is, with advantage.

The patient will perhaps complain that in all this he is treated like a child, and offered milk, eggs, and broth, when he should be eating chops and drinking stout. But if his digestive powers are reduced to the condition of those of a child, by all means should he be fed as one. There is no opprobrium attached to the name of *milk-diet*. It is a highly nitrogenous and nutritious food, and in general very digestible. The addition of lime-water, or of an egg, with a teaspoonful of brandy, or a grain or two of cayenne pepper, to the milk, makes it one of the most stimulating, as well as digestible, substances which we can administer; and then, it is *all* nourishment.

There are other animal substances which, from their tender and gelatinous nature, approach nearly to milk and eggs in utility. First amongst these stands the stomach of the cow—tripe. Tripe when liked is one of the lightest and pleasantest of foods. Its presence in the stomach seems not to be felt at all; and it takes scarcely more than an hour in digesting. Tripe should be first soaked in water, and then well boiled in milk, and eaten with bread sauce, with a *soupçon* of onion in it.

Sweetbreads, liver, and the other internal parts of animals, except the heart, are very easy of *digestion*. Then come *chicken* and lamb. All

these things should be well *boiled*, even if they be browned before the fire afterwards.

As regards fowls, rabbits, &c., except they be very young, they are very doubtful articles for an invalid's stomach. Their fibre is hard and stringy, and the stomach has often much more difficulty in separating them from each other than it has in the case of tender mutton, or even beef. If at all hard, they should always be well *stewed*.

Of fish, oysters, fresh and raw, with a little vinegar and pepper, are undoubtedly the easiest of digestion, as they are also provocative of appetite. Next come trout, grayling, and some other kinds of fresh-water fish; then haddock, whiting, flounders, soles, &c.; salmon, turbot, and mullet, are quite *too good* for the invalid to *begin* with.

But whilst the invalid is confined to this class of food, one which may be called the mildly albuminous, farinaceous substances of easy digestion, should still form the *principal* portion of his diet. If he cannot eat bread, a little good biscuit broken into his soup or milk will be necessary. Or he may supply the place of this cereal by thickening milk with oatmeal. Light batter-puddings, with the gravy of meat poured over them, are delicious; or batter balls may be put into the soup in the Italian fashion. Macaroni, tapioca, and vermicelli, are all also excellent substitutes for bread. A good meat soup, with plenty of macaroni and a little cayenne in it, will make an excellent luncheon for an invalid who has

resumed his late hour of dinner. Macaroni, vermicelli, and tapioca, do well also boiled in milk, or made into puddings.

Whenever stewed or boiled fruit makes a portion of the invalid's dietary, as it often may with advantage, it should be done with breadcrumbs well browned, and mixed together in eating, so that the stomach, in attacking the crumbs, may get the fruit unawares.*

Rice is generally spoiled for the invalid's use by not being half boiled. If boiled to a pulp and well dried, it also forms a good vehicle for stewed fruit.

Difference between Albuminous and Starchy Food in regard of Digestion.

Salivary Digestion.—With regard to passing from a diet which is chiefly farinaceous and vegetable, or at most albuminous, to one of a more animal and *fibrinous* character, it will be well to remember what was observed in the chapter on sick-room diet, viz. that there is an *essential difference* between the mode in which starchy substances, such as bread, biscuit, potatoes, rice, &c., and that in which animal substances are digested. Starch, which constitutes the largest portion of

* A nice way to serve roasted apples is to press the pulp through a small sieve, so as to separate all the stringy fibre; then to work it up into a shape with the addition of sugar and a little butter, and surround the mass with these hot, brown *breadcrumbs.* See Diets in Appendix.

flour, of the different grains of the pulp of potatoes, of arrowroot, sago, tapioca, &c., is acted upon chiefly by the saliva of the mouth. By this fluid alone these matters can be reduced to a pulpy, homogeneous, saccharine mass, half digested, and ready to take on the next stage of digestion, viz. the formation of fresh compounds out of the old. It does not appear that the gastric juice of the stomach has much to do with the digestion of starch; but the juices of the small intestines, which resemble the saliva in composition, seems to be required to finish the process which was begun in the mouth and stomach.

Here, then, we see a reason for restricting the diet to these articles of food chiefly, so long as digestion in the stomach is very feeble, or altogether abolished. If the debilitated state of the patient absolutely requires nitrogenous food, it must be given as thin beef-tea, or Gillon's essence, which are probably absorbed into the blood with comparatively little change.

On the other hand, starchy foods require to be thoroughly masticated, or they will certainly disagree. Have you not seen an old nurse, when feeding a baby with pap, first put every spoonful into her own mouth before giving it into that of the child? We think this a nasty process, but it is a physiological one. The old crone supplies the saliva to the starch which is necessary for its perfect digestion. How she ever came by this piece of scientific dietetics, I know not. Perhaps

it is instinct. Again, all starchy foods require to be thoroughly well boiled. The starch consists of minute globules, or cells, which are each enclosed in a tough capsule, or skin; these are almost impenetrable by the stomach, and require long-continued heat and moisture to burst them. Therefore it is a mistake to add rice, barley, or groats, to broth, or make them into puddings, without their having been *previously* well boiled, to burst the starch cells. In fact this class of substances cannot well be cooked too much; for if they are underdone, they convey no nutriment to the invalid stomach.

Deficiency of Gastric Juice.—When the stomach has been debilitated by protracted disease, and the blood has become too poor to provide gastric juice in sufficient quantity and of good quality, such as is required for the solution of animal flesh, it will be always necessary to take the first *solid* food from the vegetable kingdom, and for some time to place our chief dependence upon that.

Vegetable, i.e. starchy, substances are not so liable to pass into putrefaction in the event of not being digested as are those taken from the animal kingdom, nor do they irritate the bowels so much in the same case.

As a general rule, then, the invalid who is progressing slowly towards solid food should make his first essays upon farinaceous articles, or a *mixture of these* with animal broths. It is non-

sense to say that mutton chops, or chickens, are as easy of digestion, and far more nutritious, than these substances. Neither of the assertions is true. *Nothing is nutritive which cannot be digested*; and when the digestive organs are in a weakened state, such food only should be given as will address itself to that organ which is the soundest. The condition of the mouth and its saliva, the stomach and its gastric juice, and of the pancreas and liver, with their fluid and bile, must each be studied separately.

These being the data which will guide us in the selection of animal and vegetable food respectively, and such being the peculiar mode of digestion as regards carbonaceous or starchy substances, it remains now to glance at the peculiarities of the digestion of animal fibre.

STOMACHIC DIGESTION.—The stomach is the principal organ concerned in the digestion of meat and other substances of animal origin. It does not matter much if they have not been submitted to the action of saliva, so long as they have been comminuted and torn to shreds by the action of the teeth. Indeed, as I have already observed, we may spare the stomach great part of its duties, in regard to the digestion of flesh, by having it reduced to a state of pulp before it is taken. This must be done by the teeth, if possible; and if not, then by mincing, pounding, and stewing. Having thus lessened the stomach's labours, it has only the second half of the process to perform, *viz. the conversion* of the food into chyme.

This process is performed by the agency of the gastric juice, and by the proper motion of the stomach, whereby the food is continually moved from end to end, and back again in the stomach, so as to bring every particle of it into direct contact with the gastric juice. As each portion becomes reduced to a pulp, it is passed on through the *pyloric orifice*, or smaller opening of the stomach, which leads into the intestines. At this portal every applicant has to stand and deliver; if any be too hard or too stringy, it is rejected, and the fluid portion only allowed to pass the gate; the rest has to make its rounds as before, until all the efforts of the stomach have been expended upon it.

To recapitulate. When the supply of gastric juice is much diminished or altogether stopped, as it is in most acute diseases, such as inflammations, fevers, &c., we must use farinaceous articles of diet—sago, arrowroot, tapioca, &c.; afterwards we may proceed to mingle with these some *clear* broth—beef-tea or Gillon's essence—until the digestive powers of the *stomach* return. But if the prostration be so great that there is no digestion either in the mouth, stomach, or intestines, clear beef-tea must be given, in the hope that it will be absorbed directly into the blood without undergoing digestion; and with it, stimulants to rouse the action of the absorbent vessels.

But, on the *other hand*, animal food can be *given* whenever the stomach has recovered itself

sufficiently to pour out gastric juice, which it will do as convalescence advances, and throughout the course of many chronic diseases. Wherever there is great waste of bodily substance, as after fevers, there animal food, or at least albuminous substances—eggs, milk, bread, &c.—will be required to fill up the void.

Thirdly, we must remember that the heat-forming powers of the system are reduced both during illness, and also generally in ill health, and during convalescence. It will be necessary to give a good share of such substances—butter, fat, sugar, starch, &c.—as will serve to produce animal heat. If we do not do this, the system will seize upon those materials which are intended for the recruiting of the bodily powers, and convert *them* into fuel. This is an extravagant and wasteful process; and explains how some convalescents remain thin and emaciated long after they have been taking a good allowance of animal food. *We must not use the building materials to light the fire with.*

Intestinal Digestion.—There are other organs besides the mouth and stomach concerned in digestion. The principal of these are the liver and the pancreas, or sweetbread. The bile and the pancreatic fluid are thrown out into the intestine just where the food makes its entrance into it from the stomach. What remains to do towards the completion of digestion is principally done here. The conversion of fat into a bland

soapy substance is supposed to be effected by the pancreatic juice, and the change of the chyme into chyle is due, in great part, to the operation of that fluid combined with the bile.

When these organs are affected, it will be advisable to make some alteration in the diet. If the flow of bile be arrested, as it is in jaundice, and some organic diseases of the liver, vegetable and fatty substances are improper. Lean meat or broths, which the stomach can manage alone, will be the best diet; and for these the appetite is, in some cases, ravenous. In the rare cases of pancreatic disease, oils and fats are not digested at all, but pass off by stool. It is clearly useless, therefore, to give them in such cases. The well-known nausea excited by fatty or rich food, when one is 'bilious,' or when the liver is out of order, shows instinctively that such things are no longer admissible. When the small intestines are the seat of disease—ulcerated or inflamed, or cancerous—it is highly important to give only the blandest food, and such as shall be entirely reduced to a soft pulp before it reaches them. For this reason solid animal food must be divested of all hard, stringy, or indigestible portions, and vegetables be reduced to an even pulp. Well-boiled rice, tapioca, and such smooth things will answer best, accompanied with clear broths, and milk and eggs.

For want of attention to these matters, patients *with ulcerated* bowels may be starved to death in

the midst of plenty. If the food is given in too coarse a form, or in such large quantity as will irritate the stomach to part with it before it is all digested, it will pass into the bowels, and irritate them so as to excite diarrhœa, which is immediately set up for the purpose of getting rid of the offending matter, and thus no nourishment is passed into the system.

Here tripe, oysters, young lamb, chicken, and winged game, will be found the best animal foods. Poorer persons may take broth thickened with rice, or barley *well boiled*, or milk with a little suet boiled in it.

Section III.—Cooking.

The digestibility of food depends in a very great degree upon the mode in which it is prepared for the stomach by cooking.

Boiling.—Of the various modes by which food is cooked — boiling, stewing, roasting, baking, frying, or broiling—none are so good for the invalid whose stomach is very feeble as boiling or slow stewing. After this comes roasting and baking, and, lastly, broiling and frying. There are, however, great individual differences which will take from the uniformity of the rule; and, as is the case with the system in general, all universal dicta upon cookery and digestion will be found to be fallacious.

It is true that by boiling meat the agreeable aroma which arises, when it is roasted especially,

from such as abound in osmazome, and certain peculiar odoriferous principles of an oily nature, such as ducks, geese, and wild fowl contain, are missed. These peculiar flavouring principles no doubt assist the digestion of such substances, and rouse the torpid stomach to increased action. Epicures well know this, and accordingly make every successive dish to eclipse its predecessors in the agreeability of its odour or the piquancy of its savour. But boiling is more effective in softening the animal fibre, and separating each fibril from another. It also bursts the starch cells of farinaceous substances, such as rice, sago, arrowroot, and potatoes, better than any other mode.

The principal effects, then, of boiling or stewing are softening of the fibrous structure of both animal and vegetable matters, and preparing them for the entrance of the saliva and of the gastric and other digestive juices. It is, therefore, most suitable in the earlier stages of convalescence, whilst the stomach is weak and unable to perform both the *reducing* and the *converting* operations which solid food imposes upon it. Its defects are, as just stated, the absence of aroma and flavour by which, in roasted meat, &c., the nerves of the mouth and stomach are excited, and *probably* a larger quantity of the digestive fluids poured out. This defect may, in some measure, be remedied by the addition of flavorous or spicy substances to boiled meat. Thus we add caper *sauce to boiled* mutton, mint sauce to lamb,

highly-seasoned sausage to turkey, and stuff boiled veal with strong herbs.

STEWING.—The best way of adding flavour to the comparative tastelessness of boiled meat where vegetables may not be eaten, is to boil or stew them along with the meat, afterwards straining them out. Thus celery, carrots, turnips, onions, may give their flavour, whilst their vegetable fibre is excluded. And, used in this way, the flavours of these substances will seldom disagree; indeed, they will add much to the digestibility of the dish.

Boiling is also much the most economical way of making use of animal food, especially for the poor; but only in case the juices which pass out of it into the water are used as soup. Poor people, who can seldom buy meat, except in very small quantities, waste one-half of it by injudicious cookery. They almost always fry or broil it, by which a large portion is dissipated, and the rest hardened and made less digestible. Could they be taught the virtues of the Frenchman's *pot au feu*, or the Spaniard's universal pipkin, they might provide their families with much more savoury meals, whilst retaining every particle of the nourishment of their food.

The waste in cooking boiled meat will be found to be much less than by any other mode of preparation.

LOSS IN COOKING.—From a set of experiments which I made with great care, to serve as a guide for a hospital dietary, I ascertained that the

average loss of *good* meat in cooking, that is, by boiling and roasting respectively, was as follows: —

BOILED MEAT.

Mutton (legs),	lost	20 per cent.
Beef, fresh	„	20 „
„ salted	„	12½ „
Pork, salted	„	12 „

ROAST MEAT.

Mutton (legs),	lost	22 per cent.
Beef (sirloin)	„	30 „
„ (rump)	„	22 „
„ other joints	„	27 „

Thus the average loss of boiled meat, taking salted and fresh together, was 16 per cent. of its weight, whilst roast meat lost, on an average of joints, 26⅔ per cent.*

It is a popular idea that boiling extracts a great part of the nutritious qualities of animal food, which is lost in the water. And so it does, if long continued or wrongly performed. But then I assume that the liquor extracted, which contains much of the saline matters found in the blood of animals, is always to be made use of—if not by the invalid himself, by others. When there is no mode of using up this liquor, it can be reduced to a minimum by stewing the meat in a very small quantity of water, which will then make good strong soup, with the addition of rice, vegetables, &c.

* For excellent dietaries for *healthy* persons, see Dr. Edward Smith's work, 'Practical Dietaries for Families, Schools, and the Labouring Classes.' 1864.

ROASTING.—Roast meat is more agreeable to the stomach of those whom illness has not deprived of much of their powers of digestion, and it may follow boiled meat as the convalescence advances towards perfect recovery. Meat intended for roasting should be quite tender before it is cooked, and the roasting should be done very slowly, so that the hardened outside case may not prevent the action of the heat upon the juices of the interior.

Roasting elicits certain flavours in meats which they did not previously possess. These empyreumatic substances are very exciting to the palate, and may cause the invalid to eat too much, unless he exercise a good deal of self-control. For about an hour after such a meal, when the *sudden* and *temporary* excitement of the stomach has passed away, he is apt to complain of a sense of fullness, and then he *thinks* that he has taken too much.

As a matter of economy, it is a good rule to boil such pieces of meat as are enveloped in a kind of skin, or membranous covering, by which the juices are retained in the meat as much as possible; whilst we should roast those which, having been cut across, as joints of beef, have nothing to prevent the exudation of their flavorous salts and juices. Thus, legs of mutton or pork, fowls, rabbits, &c., may properly be boiled, since the membranous covering which envelopes them will retain most of their juices; but beef, game, ducks, geese, &c., which depend

for their pleasantness upon their high flavour, must be roasted in order to develope their savoury properties.

Section IV.—Digestibility of Food.

Still keeping in view, for the present, the *digestibility* of food in preference to its *nutritive* qualities, it will be advisable to refer to the experiments which have been made, both in this country and abroad, with a view to fix the average period required for the digestion of some of the most usual articles of diet.

The importance of such knowledge has always been a desideratum, and many have been the experiments which have been made with a view to ascertain the period required for the digestion of various articles of food. In the olden times they could think of no better way of arriving at this knowledge than giving persons various kinds of food enclosed in little ivory balls with a string attached, so that, after they had remained for a certain period in the stomach, they might be bobbed up again by a jerk of the string. Others took emetics to bring the contents of the stomach again into view at certain stages of digestion. Unfortunate dogs, *corpora vilia*, unfit for anything but vivisection, were killed at certain stated times after having been induced to swallow the experimental rations. But all these coarse methods of investigation had some besetting fault which vitiated the results. The thought of having his stomach made into a *fish-pond*, with rod and line waiting to hook up

the fish—or, worse, of having to swallow a nasty emetic soon after his beefsteak—was not likely to promote a comfortable and happy state of digestion in the person experimented upon. The stomach got aware of the tricks played upon it, and refused to operate in a *normal* manner. Then it was found that a dog's stomach would only perform the digestion of a dog, and there was no guarantee that the canine gastric juice would operate with exactly the same rapidity as that of his master. So, until of late years, it might be said that the degree of the digestibility of various articles of common diet was an almost unknown quantity. Individual differences vitiated any general conclusions, and took from such experiments most of their value. Indeed, we may still say that, whilst the *nutritive values* of the different articles of diet taken both from the animal and from the vegetable kingdoms have been demonstrated by the advances of organic chemistry, so as to stand like the A B C in an algebraical formula, their degrees of digestibility, from peculiarities of habit and temperament, will still take rank only amongst the unknown quantities of X Y Z.

Accident, however, has furnished us with an approach to accuracy which we should look for in vain by the ancient crude methods of experimenting. There have been, within the last thirty-five years, two instances of a peculiar and rare form of accident, which, so to speak, placed a window in the breasts of the subjects of them, through which

the inquisitive eye of science might peep in to take a look at the proceedings of the organ in question—just as Momus of old would have had the gods to place a window in every man's breast, that the thoughts of his heart might be seen.

The first case was that which has now become celebrated throughout Europe and America by reason of the long series of interesting experiments to which the poor fellow was subjected, both in America, where it occurred, and also in Europe. The other case happened in Germany.

BEAUMONT'S EXPERIMENTS.—By far the most valuable results were obtained from the American, or rather Canadian, St. Martin; who, fortunately for science, fell into the hands of an enterprising and intelligent physician, Dr. Beaumont, whose experiments have been tabulated, and have served physiologists to descant upon ever since. Well known to everyone with only a smattering of physiology, and to readers generally, as these tables have become, and notwithstanding that it is now many years since they were made, and without the light which subsequent investigation of the different stages and processes of digestion has thrown upon the subject, there are yet no better to be placed before the reader to guide him in the selection of his food, and to the best mode of cooking it. If taken with the 'grain of salt' which all such results require, it may be assumed that the general deductions which have been drawn from them on the question of diet, are fundamentally sound.

For this reason I shall here reproduce Dr. Beaumont's tables, as made originally from his own experiments, and at a period in the history of the person experimented upon, when, it may be supposed, his digestive organs were in the healthiest condition.

Table showing the mean time required for Digestion of the more usual articles of Diet. Compiled from DR. BEAUMONT'S EXPERIMENTS UPON ST. MARTIN; *arranged in order of rapidity of Digestion.*

1. FARINACEOUS AND VEGETABLE SUBSTANCES.

Article	Mode of Cooking	Time of Digestion h. m.
Rice	Boiled	1 0
Apples (sweet)	Raw	1 3
Sago	Boiled	1 45
Tapioca	Boiled	2 0
Apples (sour)	Raw	2 50
Beans	Boiled	2 30
Potatoes	Roasted or baked	2 30
Cabbage	Raw	2 30
Carrot	Boiled	3 15
Bread (from Indian corn)	Baked	3 15
Bread (from wheat)	Baked	3 30
Turnips	Boiled	3 30
Potatoes	Boiled	3 30
Cabbage	Boiled	4 30

EGGS, BUTTER, CHEESE, ETC.

Eggs (fresh)	Raw	2 0
„	Roasted	2 15
„	Soft-boiled	3 0
„	Hard-boiled	3 30

Article	Mode of Cooking	Time of Digestion h. m.
Eggs (fresh)	Fried	3 30
Custard		2 45
Butter	Melted	3 30
Cheese (old strong)	Raw	3 30

Fish.

Trout	Boiled or fried	1 30
Cod	Cured and boiled	2 0
Oysters	Fresh and raw	2 55
„	Roasted	3 15
„	Stewed	3 15
Flounders, and other flat fish	Fried	3 30
Salmon	Salted or boiled	4 0

Soups.

Barley-broth	1 30
Hash of meat and vegetables	2 30
Soup, Chicken	3 0
„ Mutton	3 30
„ Oyster	3 30
„ Beef, with marrow bones	4 15

Flesh-Meat, etc.

Tripe	Boiled	1 0
Venison	Broiled	1 35
Liver	Broiled	2 0
Turkey	Boiled	2 25
„	Roasted	2 30
Jelly		2 30
Goose	Roasted	2 30
Sucking pig	Roasted	2 30
Lamb	Broiled	2 30
Chicken, full grown	Fricaseed	2 45
Beef	Boiled	2 45
„ lean	Roasted, underdone	3 0
„ steak	Broiled	3 0

Article	Mode of Cooking	Time of Digestion h. m.
Mutton	Boiled or broiled . .	3 0
„	Fresh, roasted . . .	3 15
Pork, salted . . .	Broiled	3 15
„ steak	Broiled	3 15
Beef, lean	Roasted	3 30
„ with mustard and vegetables . . .	Boiled	3 30
„	Fried	4 0
„ hard salt . . .	Boiled	4 15
Veal	Broiled	4 0
„	Fried	4 30
Fowls and ducks . .	Broiled or roasted . .	4 0
Pork, salted (2nd) . .	Broiled	4 15
„ . . .	Boiled	4 30
Wild ducks . . .	Roasted	4 30
Suet, mutton . . .	Boiled	4 30
Heart	Fried	5 4
Pork	Roasted	5 15
Suet, beef	Boiled	5 30

Other experiments have thrown a little doubt upon the correctness of some of the items in this table; nevertheless, for general purposes, and as an average, it is undoubtedly borne out by the feelings and experience of most people who have paid attention to the subject.

A careful inspection of this table will show that there is no regular order in the degree of digestibility as regards allied substances. Some articles, the least expected, rise to the top of the tree, to the acme of digestive perfection, whilst other old favourites are sunk into disgrace. Rice, sago, tapioca, amongst farinaceous articles; eggs, trout, oysters, cod-fish, barley-broth, turkey, lamb,

chicken, are all found where long observation had placed them; whilst tripe, venison, liver, &c., have unexpectedly passed to the head of their class. As a rule, boiled meat is more quickly digested than by any other mode of cooking; whilst broiled meat, the favourite dish of Americans, is found to be generally not less digestible than roast.

Let it be always borne in mind that this table has nothing to do with the *nutritive* value of the articles named in it; that is an entirely different matter—one to be hereafter commented upon. The rapidity with which a substance passes out of the stomach (the first act of digestion having been completed), is by many held to be only an index of the small quantity of nutriment contained in it. They give this organ the discriminating power of being able to feel what amount of nutriment can be extracted from any article subjected to its operations, and they believe that it detains the food for a longer or shorter period, according to the greater or less amount of nutriment to be got out of it. In this way, they explain the meaning of the terms *satisfying* and *unsatisfying*, as applied to articles of food. When the stomach is engaged with them for a long time, on account of the *large* quantity of nutriment they contain, they are called *satisfying*, because the return of the feeling of hunger and void is longer delayed than when the stomach dismisses the food in a briefer period.

According to this view, therefore, things which

are slow of digestion are generally nutritive; and vice versâ; whilst others, which give the stomach no trouble, are of little nourishing value. It is evident that this theory is only partly true, and makes no allowance for those infinite *idiosyncracies* and vagaries of the most eccentric of organs, by which 'what is one man's meat becomes,' in the old proverb, 'another's poison.'

The digestibility of animal food, moreover, varies exceedingly according to the age, mode of feeding, and the species of animal used for food. The flesh of all young animals is easier of digestion than that of old, because its fibres are more easily separable, and the investing membrane is softer. It also contains a good deal of gelatine, which accompanies the cellular tissue and tendons; and when the animal is well fed, fat globules are incorporated with the albumen of the muscle over every part of the carcase. In nutritive value, however, young meat is inferior to that which is mature.*

By the excellent mode of feeding of the present day, the fat is so intimately blended with the lean of meat that there is sufficient in this for all the

* The early age at which the British farmer now strives to bring his produce to market, has deprived the *bons vivans* of their eight-year old mutton, and their beef stall-fed for two or three seasons. In consequence, we miss the fine flavour of the old wether mutton; but the invalid procures a much more easily digestible food by the substitution of the tender fibre of the two years old for the tough and stringy one of former days.

purposes of the system in the way of the demand for fat, without the delicate stomach of the invalid being required to attempt to digest solid fat in a separate form.

Moreover, by choosing young meat, the invalid will avoid the necessity for hanging it, which frequently results in its becoming tainted. Fortunately, the craving for highly kept or half-putrid food is passing away, with other abominable habits of feeding. The invalid, especially, should eschew all approach to putridity in his food; for although the gastric juice in health seems to have the power of removing incipient putrefaction, and restoring its freshness to animal fibre, delicate stomachs revolt at it, and it not unfrequently sets up a most violent irritation in the digestive organs, giving rise to cramps and spasms, or to diarrhœa, which testify to the poisoning of the system by these substances. If by chance the meat which the invalid must eat should have become a little tainted, it should be rubbed over with pyroligneous acid (strong distilled vinegar), and then be immediately cooked by roasting.

Vegetables should be chosen chiefly with regard to ripeness and rapidity of growth. Turnips, carrots, &c., should be grown rapidly on good ground. They are then most pulpy and tender. Potatoes must, of course, be quite ripe. Peas, beans, kidney-beans, artichokes, &c., are digestible chiefly in proportion to their being well cooked. *Raw* vegetables are quite inadmissible.

Section V.—Nutritive Properties of Food.

The nutritive properties of food must now engage our attention. It is true that the invalid, being generally supplied with the best and most nutritious kinds of aliment, need be in no fear of not finding sufficient nutriment in the food he eats; yet such has been the advance of animal chemistry of late years in this direction, and so exact have been the analyses of both the ultimate and proximate principles contained in the various articles of food in general consumption, that it will not do to overlook a department of diet which is now attracting so much attention, not only amongst chemists and physiologists, but with the general reading public.

I have already given my reasons for bestowing the first place upon the *digestibility* of food, which reasons are based upon the fact that whatever is *not digested* is useless as a material of diet, however nutritive its properties may be. That only is aliment which is able to enter the blood and be carried by it to the tissues of the body; and it is from the wants of these tissues that the supply of nutriment has to be calculated.

It is confessedly difficult to ascertain what are the wants in the way of fresh supplies of aliment of the average man in health. Every individual is in this respect, as in most others, a law unto himself; and therefore any attempt to construct a diet table suitable to *all* persons, or to all persons of any one class, age, sex, or employment,

must signally fail. All we can do is to strike an average, and allow each person to modify that average according to the dictates of his own feelings. It is all very well to say that such and such an amount of exertion destroys such and such a quantity of the tissues—bone, muscle, nerve—and that it must be replaced by so much plastic matter containing a certain quantity of nitrogen; and that the animal heat expended in the same amount of exertion has consumed such a quantity of carbon, which must be replaced by so much oil, or fat, or starch, or sugar. Nothing is more true in the abstract; but then we are met by the fact that some people consume a much larger quantity of both kinds of food in health than others, with the same or even a *less* amount of exertion; that is to say, that some persons seem to have the faculty of making a little waste of tissue go a long way, just as some people, by judicious expenditure, make their money go further than others. Many small eaters are persons of very active habits; whilst gourmands, on the other hand, are generally lazy and inert, except at the dinner-table. In fact, it does not appear to me that mechanical force and vital materials are yet proved to be convertible terms with the same degree of equation as is observed in the physical world; and, moreover, a vast amount of nutritive material is expended, by some subjects, in unavailing excitement and ex*haustive* expenditure of function.

Relation of Supply to Waste.—There are two

factors in this question of how to apportion supply to waste, which, I think, are often lost sight of—I mean the temperament of body, and the character of the nervous energy. These are so various in every individual, and react with such constant and imperative influence upon the bodily functions, that they will ever remove man from the category of a mere living machine, that is set going by certain vital stimuli, and whose work may be judged of by the amount of fuel supplied to the engine. *Individuality*, the great characteristic of all living beings, here comes into play, and asserts its privilege of always being consulted whenever we are providing for anything which touches the welfare or the movements of the animal frame.

This position is, I think, proved by the fact that, in calculating the amount of sustenance which the human machine requires per diem to enable it to perform its functions in a normal manner, no better way has been found than that of calculating the waste the system is undergoing, as exhibited in the various excreta of the body. The carbonic acid gas, the animal matter—urea —and the salts, with watery vapour, are the principal excrementitious substances derived from the blood, and all of these can be accurately measured and weighed; and it is not difficult *now* to calculate a diet which shall present the exact quantity of proximate principles from which an amount of new tissue sufficient to replace those which have been oxidised into these effete *substances* can be formed.

Now, this appears to be begging the questions of '*How* much food is requisite for a healthy person in twenty-four hours; and what is the proportion of its various kinds most suitable to his wants?' Because it is impossible to say what amount of daily waste is normal to anyone, inasmuch as it depends upon the most varying circumstances: habit, temperature, exercise. Moreover, the waste, in health, is made to keep pace, as much as possible, with the supplies; for as long as she can, nature appears to endeavour to maintain the adult body in the same condition as regards bulk, &c., whatever be the quantity of food taken. If, therefore, the functions take their cue from the *ingesta*—the quantity eaten and drunken—and provide for their disposal, it will be the most complete reasoning in a circle, first to calculate the amount of food required from the *actual* waste, and then to expect a corresponding amount of waste from a certain quantity of food, reciprocally.

If we could fix upon any standard whereby to measure a normal amount of bodily activity, and observe the waste which will arise from the exercise of that amount of function, then we should be in a position to say exactly what ought to be the quantity and kind of nutriment which should be taken into the body to replace that normal waste. But then, to do this, we should have not only to fix upon a normal typical structure for the human body, but to measure the nutrient, nervous, and *intellectual* energies, also. Moreover, we should *have to assume*, what is far from being the case,

that this normal structure would act in the same manner, *in regard to its functions*, under *all* circumstances; or else that, knowing the alteration of circumstances, we should be able to compute the change in function, which we cannot do, nor shall ever be able to do. We should also require to estimate the effects of the *undemonstrative*, or *passive* emotions of the mind upon the functions, which, from their very nature, will always be an unknown quantity.

As affected by Disease.—Lastly, disease will always disturb our averages and disarrange our tables. If one man differs from every other man in the physical conformation of his organs, and in the play of their functions, he differs from *himself* during disease, and that in the most rapid and changeable manner. The diet of to-day, therefore, is superseded to-morrow; and nothing but individual experience, guided by the empiricism of the most careful observation, will enable us to apply our rules of health to the case of sickness, in whatever modification we may fix upon.

Nevertheless, it will always be in the power of the scientific and observant physician to modify his patient's diet, or to recommend the invalid to modify his, according to the class of tissue which he desires to affect, and the effect which he wishes to produce upon each. If, for instance, the muscles are wasting, the heart and vascular system weak, he will know to give such food as is now well known to be particularly restorative of those *structures*. These are the flesh-forming

or albuminous substances, to which reference will be immediately made.

Again, if the nervous force is debilitated, along with this kind of food he will give a proper amount of fats, oil, butter, suet, cocoa, eggs, milk, cheese, or bread. If he merely wish to sustain the vital powers, and principally the heat of the body, whilst disease expends itself in destruction of tissue, as it does in fevers, &c., the digestive powers being unequal to the meats, soups, &c., necessary to repair the waste, he will know that rice, arrowroot, potatoes, tapioca, maize, sugar, jelly, &c., will do this; and at the same time save the patient's flesh from being burnt up to supply fuel for the increased animal heat. At the latter end of fevers, when digestion begins to return, and the fire has burnt itself out, he will strive to repair the *albuminous* tissues—the muscles, the nerves, the sinews, and perhaps the bones—by an animal diet rich in albuminous or flesh-forming materials.

It is a fact too much overlooked in these flesh-eating days, that farinaceous, or starchy substances, although they may not be very useful in forming new tissue, will yet save the destruction of the old, by presenting the vital chemistry with large quantities of oxidisable material to be burnt up to supply the heat of the body. And, moreover, they will generally be found digestible at a very much earlier date in the course of acute *disease* than animal food will be. And I have no *doubt that* our forefathers were in great measure

right in looking upon farinaceous (starchy) foods as the proper diet in acute disease, and animal food as only proper to follow when it was the proper time to repair the waste caused by disease; and then only tentatively, cautiously, and with its effects duly watched. And in this opinion I seem to be borne out by some of the best writers on diet of the day; particularly by Dr. Parkes, who admits, however, that physicians are not yet able to apply the facts relative to the *nutritive* value of food to the case of disease with anything like the certainty with which they are enabled, by exact experiment, to apportion the digestibility of different aliments to the debilitated stomach.

Analysis of the Nutritive Properties of Food.

A great many analysts have bestowed their attention upon this subject since the announcement of the great doctrine of Liebig of the division of nutritive substances, in the main, into two great classes, viz. the flesh makers and the heat makers. We have, accordingly, a great variety of tables in which the chemical composition of food is set forth. Many of these we owe to the indefatigable labours of German enquirers, although our own countrymen have not been behind-hand in this work. There are differences in the results, as must necessarily happen in all such investigations, from the difference of materials acted upon, as well as from the amount of skill and labour bestowed in their analyzation. The latest is the following:—

TABLE OF THE COMPOSITION OF FOOD IN 100 PARTS.

BY DR. LYON PLAYFAIR, C.B.

Professor of Chemistry in the University of Edinburgh, &c. &c. 1864.

Name	Water	Flesh Formers	Heat Givers	Starch equivlnt. of Heat Givers	Ratio of Flesh Formers to starch equivalent	Mineral matter	Carbon in Flesh Formers	Carbon in Heat Givers	Total Carbon
Lean butchers' meat, free from bone . . .	67·0	23·0	Fat . . . 8·0	19· 2	1 to 0·33	2· 0	12· 37	6· 16	18· 53
Fat, do. do. . . .	63·0	15·0	Fat . . . 20·0	48· 0	1 „ 3· 2	2· 0	8· 07	15· 4	23· 47
Mean of lean and fat butchers' meat, free from bone . . .	65·0	19·0	Fat . . . 14·0	33· 6	1 „ 1·77	2· 0	10· 22	10· 78	21· 00
Fresh fish, free from bone	81·3	12·5	Fat . . . 5·2	12· 5	1 „ 1· 0	1· 0	6· 5	3· 8	10· 3
Salt herring	49·0	20·0	Fat . . . 12·7	30·45	1 „ 1·52	18· 3	10· 76	9· 78	20· 54
Milk, new	87·2	4·0	Fat . . . 3·5 Sugar . . 4·6	12· 5	1 „ 3·12	0·70	2·152	4·535	6·687
„ skimmed . . .	88·6	4·0	Fat . . . 2·0 Sugar . . 4·6	8. 8	1 „ 2· 2	0·77	2·152	3·380	5·532
„ butter	89·1	4·0	Fat . . . 1·5 Sugar . . 4·6	7· 6	1 „ 1·87	0·75	2·152	2·995	5·147
Cheese, cheap kinds . .	40·0	30·0	Fat . . . 26·0	62· 4	1 „ 2·08	4· 0	16· 14	20· 02	36· 16
Eggs, yolk and white .	75·0	12.6	Fat . . . 11·0	26· 4	1 „ 2·09	1· 4	6·788	8· 47	15· 26
Peas, green	55·0	7·0	Starch, &c. . 35·0 Fat . . . 1·0	37· 4	1 „ 5·34	2· 0	3·766	16· 31	20·076
„ dry	15·0	22·0	Starch, &c. . 58·5 Fat . . . 2·0	63· 3	1 „ 2·87	2· 5	11·836	27·514	39· 35
Beans, dry	12·0	26·0	Starch, &c. . 57·0 Fat . . . 2·0	61· 8	1 „ 2·37	3· 0	13·988	26· 85	40. 84
Lentils	12·5	27·0	Starch, &c. . 55·0 Fat . . . 2·5	61· 0	1 „ 2·26	3· 0	14·526	26 34	40· 86

Flour	13·3	14·0	Starch, &c. 70·0 Fat 1·5	73· 6	1 to	5·26	1· 2	7·552	31· 08	38· 61
Bread	44·8	8·2	Starch, &c. 44·5 Fat 1·0	46· 9	1 „	5·72	1· 5	4·411	20· 52	24· 93
Biscuit	13·8	14·2	Starch, &c. 69·3 Fat 1·0	71· 7	1 „	5·05	1· 7	7· 64	51·539	59·179
Barley, pearl	15·1	8·0	Starch, &c. 74·0 Fat 2·0	78· 8	1 „	9·85	0· 9	4·304	34·396	38· 69
Oatmeal	13·0	16·0	Starch, &c. 62·0 Fat 6·0	76· 4	1 „	4·77	3· 0	8·608	32· 35	40·95
Maize	12·0	11·0	Starch, &c. 68·5 Fat 7·0	85· 3	1 „	7·75	1· 5	5·918	35·804	41·722
Rice	13·0	6·5	Starch, &c. 79·2 Fat 0·8	81. 1	1 „	12·48	0· 5	3·497	35·781	39·278
Potatoes	75·0	1·4	Starch, &c. 22·5 Fat 1·0	22· 7	1 „	16·21	1· 0	0·753	10·715	11·468
Parsnips	85·1	1·4	Starch, &c. 10·0 Sugar 2·5	12· 4	1 „	8·18	1· 0	0·753	5·492	6·245
Carrots	86·5	1·3	Starch, &c. 6·30 Fat 0·15 Sugar 5·0	11. 3	1 „	8·70	0· 8	0·7	5·417	6·117
Turnips	91·1	1·2	Starch, &c. 3·2 Sugar 3·0	6· 1	1 „	5·08	1· 5	0·645	2·684	3·329
Succulent vegetables	85·8	1·3	Starch, &c. 12·2	12· 2	1 „	9· 4	0· 7	0·7	5·417	6·117
Arrowroot	12·0	1·0	Starch 86·7	86· 7	1 „	86·7	0· 3	0·538	38· 49	39· 03
Sago	14·8	1·5	Starch 83·5	83· 5	1 „	55·6	0. 2	0·807	37·074	37·881
Tapioca	13·0	2·0	Starch 84·7	84· 7	1 „	42·3	0· 3	1·076	37·607	38·683
Sugar	5·0	0·0	Sugar 95·0	91· 5	. .	. .	0· 0	0·0	39· 99	39· 99
Butter	13·0	1·0	Fat 86·0	206·	1 „	206·	0· 0	0·538	62· 22	66·758
Suet	13·0	0·0	Fat 87·0	208·	. .	. .	0· 0	0·00	66· 99	66· 99
Lard	8·0	2·0	Fat 90.0	216·	1 „	108·	0· 0	0·076	69· 3	70·376

NOTE.—In this Table 10 parts of Fat are considered equal to 24 parts of Starch. Under the head of 'Starch, &c.' cellulose and gum are included. The amount of Carbon is taken as follows:—

Flesh Formers	53· 8 per cent. carbon	Sugar of Milk	40·0 per cent. carbon
Starch	44·44 „ „	Fat	77·0
Sugar (cane)	42· 1 „ „		

T 2

be made of the albuminous, or flesh-makers; of the fatty, or complimentary flesh-formers and heat-givers; of the starchy or sugary substances, which appear to be destined almost entirely to calorificant purposes; and of mineral matters—lime, sulphur, phosphorus, potash, and soda—contained both in the flesh of animals and in green vegetables; these will all be requisite for the constitution of a perfect diet.

The total quantity, however, must vary, as it does in health, according to the age, sex, and temperament of the invalid. Old people, who do not waste their tissues with the same rapidity as the young or adult, will require but a small proportion of flesh-formers, whilst the carboniferous diet—starch, sugar, &c.—should be large, inasmuch as they require that the animal heat should be kept up. For them, as for the young, milk is an excellent food. For women, one-fourth less may be calculated than is required for men.

Again, the diet must be varied, as to the source whence its principles are derived. It is true that the system deals only with those proximate chemical principles, albumen, casein, fibrin, oil, starch, sugar, gum, &c., but the stomach enquires from what substances they have been derived, and insists upon a variety to prevent satiety and cloying. Flesh must come from different animals, although its ultimate composition may be identical; the starch must be got, now from the potato, another time from rice, arrowroot, or sago; the

fat from butter, olive-oil, cocoa, cheese, milk, bacon, or the fat of meat; and green vegetables should be used in a variety of at least three or four.

In providing variety, however, we must be careful to guard against an evil which often follows in its train, viz., over-feeding.

Quantity of Nutriment.

It is generally allowed that from twenty-four to thirty-six ounces of real nutriment is taken by an average-sized adult man in the twenty-four hours; or, if the amount be calculated as *anhydrous*, that is, divested of the water which every kind of food contains, from nineteen to twenty-four ounces. With this he will drink from three to five pints of fluid—water, milk, tea, beer, &c.*

Now, the proportion of one kind of food to another must be made to vary according to the mode of life, exertion, amount of respiration, &c., which anyone undergoes. If much manual labour in the open air be done, then he will want both flesh-formers and heat-givers in full supply; for

* Dr. Parkes gives the following daily average amount of food and drink for men of mean height and size—5 ft. 6 in. to 5 ft. 10 in., and weighing from 140 to 160 lbs.—under different conditions of activity.

When nearly at rest	water-free food	18·5 oz.	water 70 to 90 oz.
In moderate exercise	„	23·	„ 70 „ 90 oz.
Under great exertion	„	26· to 30·	„ 80 „ 100 oz. or more.
Under enormous exertion	„	30· „ 36· or 40·	water, uncertain.

unless he have a due allowance of the latter, his muscles will be used up not only in creating physical force, but in supporting the heat of the body. If an in-door employment be pursued, with little excitement of the breathing, a moderate allowance of flesh-formers, with a diminished one of heat-givers, will be proper. If the work be carried on in hot rooms, such as factories, &c., then the last must be *greatly* diminished.

A healthy working man will consume in twenty-four hours—

4½ ounces of albumen, or flesh-forming food;
1⅓ „ of fat;
16 to 17 „ of starch, or heat-giving food, free from water; total, 22 ounces, water free.

Salt meat is both less digestible and less nutritious than fresh, and must in general be reckoned as one-third less. But it is unsuited to the invalid, as taxing his digestive organs more for a comparatively less result.

Application of these Observations to Disease.

If we now attempt to apply these results of analysis and experiment, entirely trustworthy as they appear to be as regards the healthy and strong, to the case of the sick and invalid, we shall find the subject surrounded with enormous difficulties. Tables and averages may do for large aggregations of individuals; indeed, they are necessary; otherwise the dietaries of our barracks, hospitals, work-*houses, schools*, &c., would get into an utterly

chaotic state; but the sick and the invalid present such continual differences, both in their own temperament, and in the phases and character of their disorders, that fixed tables are less applicable to their case than to any other.

Even in our hospitals, what are called *extras* are every day introduced into, or something is removed from, the diet; showing that as disease refuses to adhere to any fixed rules, so we must shift our ground of attack, and change our arms, both of offence and defence, with its ever-changing features.

We should first direct our attention to a few general principles which certain disordered states of the system indicate in the apportioning of diet; and having fixed these, the details and variations for individual peculiarities will be more readily filled in by the physician at the bedside, or by the invalid for himself.

Whenever *low* diet is indicated, as in the commencement of fevers, inflammatory affections, hæmorrhage, mucous disorder of the stomach or bowels, acute dyspepsia, acute rheumatism and gout, or plethoric and congestive condition of any vital organ, I would understand low diet to mean a non-nitrogenous one; that is, one which shall feed the tissues least, whilst it affords sufficient material for supporting the heat of the body, to prevent the flesh being wasted for that purpose. This diet will also be the easiest of digestion. It may consist of starchy matters, such as arrowroot, sago,

tapioca, rice, potato-flour, maize flour, with a moderate quantity of milk.

With this diet, a proper allowance of fluid—water, tea, or barley-water—must always be given, for the purpose of assisting the secretion of the lungs, skin, kidneys, and bowels. The restriction of water in disease is a physiological blunder of the most injurious tendency.

When nourishment is required for the heart and muscular system, whilst the stomach is still out of gear, we must give albuminous matters in a *liquid state* along with the above. Beef-tea, with jelly dissolved in it, eggs beaten up with wine, &c., in the hope (for it is *but a hope*, being still unproved by experiment) that they will be absorbed directly into the system without having to undergo much digestion.

It is very doubtful whether the modern practice of cramming very weak patients with nourishing food—beef-tea, arrowroot, &c.—every hour or so, is founded upon correct observation. It certainly has no warrant in what we know of digestion, most soups taking from $2\frac{1}{2}$ to $3\frac{1}{2}$ hours for their digestion in health. It does not appear that anything but water and the volatile essences of such things as tea, coffee, &c., are *rapidly* absorbed in acute disease. And if the solid portion of these liquid foods is left behind to pass into the bowels as refuse matter, there can be no good done by their so frequently repeated introduction. We frequently hear of patients taking

food *every half-hour* or so, cupful after cupful. Yet we see no effect upon the system. It still sinks and sinks; although the patient is refreshed, probably by the large quantity of water which this kind of food contains.

A diet to suit the dyspeptic invalid who yet requires a good deal of nourishment to replace the waste produced by any kind of exertion, whether of mind or body, or the exhausting influence of pain, is a desideratum indeed. And it is just the difficulty on this point which has so long fed the pockets of the hosts of dietetic quacks, who are only a degree less pernicious than the drug-nostrum-mongers.

Whenever the stomach is the organ *primarily* affected, as in most of the varieties of indigestion; or secondarily, as in gout, liver disease, &c., the easy digestibility of the food must be the *first* and indispensable consideration. The invalid must search the Tables for such food, and compare their stated effects with his own experience; for in this respect at least the adage is true that a man 'will be either a fool or a physician at forty.' Dr. Chambers* gives a caution in respect to the diet of dyspeptics which I here repeat, as likely to be of great service if followed. It is, never to mix together at one meal substances whose digestion is performed in a different manner. If you give a chop, give it along with a very little bread, not

* 'The Renewal of Life.' 2nd. edit. 1863.

with a mass of rice or potato, which is not digested along with the chop, but in the intestines into which the stomach tries to force it (probably before it has done with the flesh). These bulky things only absorb and run away with the gastric juice which is wanted for the digestion of the chop. If rice, arrowroot, puddings, &c., be given at all, let them form a separate meal.

Brande stated the nutritive powers of some of the commoner meats to be as follows :—

Liver	. .	as	. . 34
Mutton	. .	„	. . 29
Fowl	. .	„	. . 27
Veal	. .	„	. . 26
Beef	. .	„	. . 25
Kidney	. .	„	. . 24

Pork, from its containing a large quantity of fat, can scarcely be compared with the above.

It is probable that this Table was formed under the idea that gelatine was a highly nutritious substance, inasmuch as veal and all young meat contains a large proportion of that substance. The doubtful position it now occupies, however, will bring veal much below beef in nutritive power.

If we compare these substances, as regards their nutritive powers, with the same substances in the order in which they stand in the Table of their digestibility, we shall be able to select those which

are *at once of the highest nutritive value, and comparatively easy of digestion,* which will stand in the following order; as—

1. Venison, also liver, turkey, tripe (from their easiness of digestion).
2. Mutton.
3. Beef.
4. Stale bread.
5. Fish.
6. Eggs.
7. Biscuit.
8. Oat cake.
9. Beans, peas, &c.

After these will come soup, lamb, chicken, milk, pearl barley, American corn flour, &c. &c.

When the very highest amount of nutriment is required to be thrown into the system, as after exhausting illness, fevers, blood diseases, surgical injuries and operations, scurvy, scrofula, diabetes, hæmorrhage, &c., and in some diseases attended by great pain, we must take the most nutritive substances that can be digested, and concentrate the *whole* energies of the digestive organs upon them, instead of wasting them upon farinaceous and starchy foods, which are of no real value to the exhausted frame. Mutton, beef, venison, tripe, liver, with bread alone, or a small quantity of rice, will answer well. Some such classified diets will be found in the Appendix, which may be varied by the practitioner or the invalid by attentive study of the two Tables of the digestibility and nutritive property of foods.

Section VI.—Time of Meals and Order of taking Food.

Great invalids cannot afford to have regular meal-hours. They must take food when they feel they can digest it, or as soon as exhaustion is felt. It is the very worst thing possible to endeavour to bring such persons to stated meal-hours. If food be not at hand when they feel they require it, the appetite goes off, but it leaves exhaustion behind it which bars food for some time to come, and then stimulants are the usual resource.

Be careful also that the most solid food is taken at that time of day when the powers of the stomach are in fullest vigour. This is seldom in the morning, nor until some amount of exercise has been undergone. Nevertheless, it is a good rule for the invalid to take solid food *before* his work rather than *after* it. He is commonly too much fatigued by the duties of the day to digest a good meal soon after his work is ended; and if that work have to be done without a good foundation having been laid in food, exhaustion is sure to ensue, and so matters are rendered worse.

Therefore it is better, in such cases, to forego the attempt at distinct meal-hours, such as take place *en famille*.

With regard to the number of meal-times, they will range from a teaspoonful every five minutes, in extreme cases, to the normal two or three *meals* a day of the healthy person. The scale

will ascend or descend as wavering convalescence now tends towards recovery, now harks back again to relapse into disease. The necessity for food in the system, and the time it takes the stomach to digest it, must be our guiding stars. If the invalid be increasing in flesh and strength, let him take food only so often as he feels exhaustion approaching. This will generally be from once to twice a day oftener than his usual habit when in health. Five hours are the proper time, speaking generally, to interpose between meals of solid food, in a state of health. Thus, if breakfast be at 8, dinner or luncheon will be at 1, and dinner or supper at 6 or 7. If breakfast be at 9, the mid-day meal should be postponed until 2, and the last till 7 or 8, with tea *between* the two chief meals. In convalescence, some light food, such as soup, cocoa, tea, and bread and butter, may be interposed in some of the intervals. It often answers very well for invalids who do not require to go to business very early in the morning, and for ladies, to take only a cup of tea or milk with a thin slice of bread and butter the first thing in the morning, and then to make a substantial breakfast at 10 or 11 o'clock. Some meat, eggs, or poultry must then be taken, and the meal may advantageously be converted into a kind of *déjeûner à la fourchette*, by adding a glass or two of light wine—claret, dry sherry, hock, or moselle —and reducing the quantity of tea or coffee, which often proves troublesome from its bulk.

When the invalid has to transact much business, or expose himself to weather, this kind of *dejeûner* will be found to fortify him for his work much better than the tea and toast and an egg, of the ordinary English breakfast-table.

In an hour or two after noon, there will be another crave for sustenance. But if the business be not got over, it is undesirable to take another meal at that time. Here it is that the glass of sherry, with biscuit or small sandwich, is the right thing in the right place, because the system has been already fortified by the substantial morning meal. Dinner may follow now at 4, 5, or even 6 o'clock in some cases, without danger to the digestive powers, unless the invalid be one in whom the necessity for food arises at short intervals, and then he must dine at 2, taking tea three hours after, to assist the digestion of the remains of the solid food.

But it is the evening meal which most tries the ingenuity both of physician and patient. When substantial food has been already taken twice, it may be thrice, during the day, and a full proportion of nitrogenous food introduced to the system, and yet *something more* is required before retiring to bed, it often puzzles one what to give. No more meat, at any rate; but a little arrowroot, with a teaspoonful or two of brandy, taken *just on going to bed*, will give the stomach a little to do, and ward off that feeling of void *which so often* banishes sleep. A cup of cocoa,

or chocolate, and slice of bread and butter, may be substituted for the arrowroot.

I have already remarked upon the impropriety of eating animal food along with tea at the evening meal—the 'heavy tea.' It is rightly named *heavy*, being highly indigestible, and physiologically 'all wrong.' The tea delays the digestion of the meat at a time when the stomach is not at its best, and the frequent effects are flatulence and a sense of fulness and heaviness for the remainder of the evening.

No; let the tea follow, at an interval of two or three hours, the principal meal of the day, whether that meal be early or late.

The foregoing rules will be found suitable for persons whose digestion is weak, indeed, but otherwise normal. There are cases, however, particularly when great debility and emaciation exist, in which supplies should be taken in at frequent intervals, but in which the digestive powers are unequal to the strain upon them. Such persons are always eating, and always suffering from it. A sense of oppression comes on half an hour or so after they have taken food, with flatulence, headache, acidity, palpitation, and coldness of the extremities, &c., or an invincible tendency to sleep. Here the gastric juice is in too small quantity to do the work imposed upon it, and that portion of the food which it fails to attack lies as a foreign body in the stomach, giving rise to the above-named distressing symptoms of dyspepsia.

(rightly so named here). Such persons never have regular bowels; they are at one time constipated from want of proper secretion; at another, there is diarrhœa, caused by the passage of undigested food through the intestines.

Whenever these phenomena show themselves, the meal has been excessive in quantity, however small that quantity may have been. You may lessen the work of the stomach by rendering vegetable food into a pulp by well stewing or boiling it, and by reducing animal food into minute particles, as well as by prolonged mastication; also by drinking small quantities of warm water at frequent intervals during the meal. With these auxiliaries, if the quantity of solid food be small, the weak organ will be coaxed to begin its labours, and so prevented from lapsing into that sullen mood which refuses to cope with its difficulties at all, but tries to get rid of its burden by vomiting.

We have still to consider the opposite case of those whose digestion is very *slow* as well as weak, and whose system requires more nutriment than there is time to digest it in.

Some people in health feed like a boa constrictor, laying in enormous loads at distant intervals. Not to quote such cases as that of the celebrated Dr. Fordyce, who *fed* himself only once in twenty-four hours, at 4 o'clock P.M., when he devoured a pound and a half to two pounds of beefsteak, frequently, if he were impatient, preceded by a

chicken or half a duck, the whole washed down with a quart of ale, a bottle of port, and a gill of brandy; nor that of a late celebrated provincial physician, Dr. Darwin of Shrewsbury, who always paid for two dinners (and ate them, too), lest the innkeepers should lose by his custom; there are a large number of persons who never touch food more than twice, sometimes only once, a day.

This habit of the stomach follows them into illness, and must be taken into consideration. In these cases the subject retains the feeling of food in the stomach for many hours, long after the exhausted system has called out for further supplies. The remedy in this case is to interpose meals of liquid food between those of solid aliment—beef-tea, milk, or milk with lime-water, or soda-water, may be got in at odd times; and being entirely fluid, will not interfere with the digestion of the former meal in any injurious manner.

Section VII.—Drinks.

If differences of opinion and conflicting assertions have been, and still are, rife with respect to the solid aliments which invalid persons use, much more is this the case in reference to their drink. And it will be found, in general, that it is much more difficult to suit the actual digestive condition of the invalid in respect of the latter than the former. For here his choice is more restricted.

There are so many things of which he is unable to partake, even if he were willing; so that the battle rages within narrower limits. Whilst every kind of beverage has its advocates and admirers, there is scarcely a drinkable fluid of any kind which has not been cried up by some as a sovereign remedy for all human ills, whilst by other wiseacres it has been declared to be no better than a poison. Foremost on this debateable ground stands cold water. Into whatever society you go, you meet with people who will tell you that to drink *cold* water is to die; and yet, as I have already said, water is that very element which most nearly accords with the material of our bodies, and is the one most greedily absorbed into the circulation.

But when, on the other hand, we hear fanatics of an opposite creed declaring that since all other drinks are artificial to man, water must be the *only* one really natural and proper for him, we may answer, that their argument proves too much; for as well might they say that the only natural way for man to take his food is uncooked, because the naked savage—the natural man—devours it so.

The truth is, that nature has provided the uncultivated savage, who is destitute of the arts of life, with certain primitive foods, which are wholesome enough for him—raw flesh, roots, and berries—and with pure water from the fountain to quench his natural thirst. But as the savage *advances* in civilisation, his primitive habits are

raised to a higher standard. No longer contented, like his fellow-beasts, with the raw fruits of the earth, he invents processes of cookery, more or less refined, to gratify that exalted sensibility of his stomach which arises from his improved physiological condition. In like manner, he has found out the art of infusing vegetable substances in water, or of fermenting them into alcohol, in order to give pleasure to his feelings, or excitement to his passions. Thus, long before the ancient Briton made his mead and the Saxon his beer, the Egyptian had his *bouzah*, the Indian his *toddy*, the Japanese his *sacki*, the Mexican his *masalo*; the Russian his *quass*; the Tartar his *koumiss*, &c.; whilst, in the present day, our more delicate organisation will suffer nothing less refined than beer, tea, coffee, wine, and spirits.

Now, unless we view the arts of civilisation as resulting from the normal, that is natural, development of our race, we shall find it impossible to justify the labour bestowed upon the refinements of cookery, or in the subtle arts of fermentation and distillation; all of which we must, in that case, yield up to the advocates of a return to the pristine habits of savage nations.

It is useless, however, to argue on such a question as this, or to fight shadows with the revilers of modern civilisation. Man modifies everything by which he is surrounded, and everything that he can he adopts to his use, pleasure, or caprice. Foremost amongst these are found

the materials for his dwelling, his clothing, and his food and drink.

And all these are highly *adaptable* and capable of modification under the various circumstances in which man finds himself; so that what some call the artificial, or unnatural use of these things, is nothing more than the carrying them along with us in our ever changing habits and feelings.

The necessity for drink depends upon two causes:—1. The fact that water is continually passing out of the system by the lungs, skin, and kidneys; and, secondly, the nature of the food and the demand for fluid by the stomach and intestines in the work of digestion, and to slake the thirst caused by salted meat, spices, &c.

The quantity of fluid which passes out of the body of a moderately sized, healthy man, in twenty-four hours, by the way of the lungs and skin, will vary from 3½ to 4½ pounds weight, i.e. 70 to 90 fluid ounces; whilst from 30 to 50 ounces more, varying according to habit of body, and the temperature of the air, are excreted by the kidneys. Without any active perspiration, then, there leaves the body from five to seven pounds weight of water in every twenty-four hours. In illness, this quantity is very often increased, particularly during the excitement of fevers, by excessive action of the lungs, skin or kidneys.

Water.—In fevers, cold water is by far the most *effective* drink. It quickly passes into the cir-

culation, where it excites either perspiration, or a diuretic effect; both of them natural means of relief in fevers. It should not be taken, however, just before or at meals, except in small quantities, as it is apt to dilute the gastric juice too much, and give rise to flatulence and indigestion. The morbid fear of cold water which still reigns in the minds of nurses and others who have the care of the sick, as well as in those of invalids themselves, is a remnant of the days when every chink and cranny was stopped up in the sick room lest a breath of life-giving fresh air should blow upon the sufferer. How strange it appears to us that through long ages (ages of darkness, it must be allowed) the restorative powers of nature and her principal agents were systematically rejected in the very cases in which they were most required! The very sources from which life and health are drawn were supposed to be converted into pestiferous or poisonous agencies the moment the healthy functions are thrown out of gear.

Even now the use of water in disease is but imperfectly acknowledged. The two processes which go on in unwonted activity in most diseases, the taking down and ejecting, and the rebuilding and restoring, both require a large supply of water. This is why thirst is so constant an accompaniment of illness. The effete particles of matter, and the noxious materials which the system is so anxious to get rid of, can be carried away only by means of

a liberal supply of fluid; and the newly digested material with which nature endeavours to supply the loss will require water as a carrier in proportion to the quantity so to be conveyed to its new destination.

A moderate allowance of fluid along with a meal is beneficial to digestion. The liquid assists the stomach to separate and dissolve the fibres of solid food, and it makes more, as it were, of the gastric juice when that is deficient.

To many persons a draught of cold water on going to bed is serviceable. In America it is the custom to take one on first rising in the morning. Neither of these habits can be adopted by the invalid indiscriminately. But after confinement for hours in the heated atmosphere of crowded rooms, a draught of cold water refrigerates and refreshes the system; soothing the nerves and conducing to sleep. Also, a draught of cold water taken on first rising in the morning tends to cool and brace the system after the heat and perspiration of the night; and it often has the effect of opening the bowels.*

* Good drinking water should be colourless, transparent, free from smell and taste. It should be moderately sparkling, and pleasant to drink. There must be no deposit at the bottom of the vessel after standing.

Dr. Parkes gives the following as the amount of matter, organic and inorganic, which water may contain without injury to its good qualities:—

Organic matter should not exceed	1½ grains per gallon
Carbonate of Lime	16 „ „

Infused Drinks—Tea, Coffee, etc.

The almost universal use of tea or coffee throughout the civilised regions of the earth, testifies, as strongly as any habit or custom can, to their suitableness to the human constitution.

No custom would have become so rapidly universal did it not supply some want of, or afford some pleasure to, our nature. This argument, to which I shall presently have to recur, when speaking of alcoholic stimulants, by no means countenances the abuse of these or any other drinks. The abuse removes the use of a thing from the category of innocence and beneficence, to that of injury and destructiveness. In speaking, therefore, of any kind of food or drink, it must, as a matter of course, be understood that the strictest temperance is implied. The moment *that* is exceeded, we have passed out of the realm of science and reason into that of ignorance and folly.

In another work,* I have gone at length into the physiological effects of tea, coffee, beer, wine, &c., upon the system, as deduced from the most exact experiments and observations which have

Sulphate of Lime	3	grains	per gallon.
Carbonate and Sulphate of Magnesia	3	„	„
Chloride of Sodium . . .	10	„	„
Carbonate of Soda	20	„	„
Sulphate of Soda	6	„	„
Iron	½	„	„

—'Manual of Practical Hygiene.' 1864.

* 'The Seven Sources of Health,' p. 169.

yet been made; I shall, therefore, here assume the truth of the propositions there laid down; reproducing only the leading facts as they bear upon the interest of the invalid and convalescent.

Keeping in view the remarkable fact of the almost absolute identity of the active principles of tea and coffee—thein and caffein—and taking their effects upon the system in the aggregate of cases without reference to individual peculiarities, the effects of tea and coffee, taken in moderation, may be stated as follows.

Physiological Effects.—The most obvious to the unscientific observer is the excitement of the nervous system—an arousing, awakening, and stimulating effect in proportion to the quantity and strength of the beverage. The first impression is made, of course, upon the nerves of the stomach, which appear to be soothed; whilst the feeling of coldness, rawness, or want of food, is appeased.

Almost simultaneously with the effect upon the nerves of the stomach occurs another upon the general system, and upon the brain in particular. This shows how quickly the active principles of these substances are absorbed. Almost immediately the sense of languor and fatigue is removed, and the system seems to have received new vigour, both cold and heat being less felt. Tea is more stimulating without the addition of cream and sugar; but if so taken, there is often a gnawing sensation remaining at the pit of the stomach, *which may* be owing to the fact that the plain tea *has conveyed* but little real nourishment into it.

The effects of tea and coffee vary greatly according to the condition of the invalid at the time, and the peroid of the day at which they are taken. Thus they may have a stimulant or a sedative effect; arousing the intellect or soothing it to repose, according to these circumstances. Pain is assuaged, a weak digestion is assisted, perspiration promoted, and in some cases, also, the action of the kidneys and bowels; and thus, whilst they will cool a fever, they will warm the frigid and exhausted frame by exciting the nerves of the stomach, and through them, those of the whole system.

If properly taken, no exhaustion or reaction follows the use of these beverages; and they have an advantage in this respect, over alcoholic stimulants, which it will be well to keep in view.

Tea.—Green tea, is, in general, inadmissible to the tea-table of the invalid unless his nervous system be very sluggish and torpid indeed, and the circulation in the brain marked by a congestive or apoplectic tendency. Green tea excites and then exhausts the nervous force; in excess, causing tremors, &c. Unlike the black variety, it leaves craving and sinking at the stomach; when used, therefore, it should be with a large admixture of black. It is, nevertheless, very serviceable for any extraordinary effort, when it is necessary to arouse the attention, or sharpen the intellect, to the highest pitch.

Convalescents may take a mixed tea, of which

green bears the proportion of a fourth to a third. In this proportion, the tea partakes of the good qualities of both kinds; for whilst the green exhilarates and enlivens the senses and the intellect, the black soothes the nerves of the stomach, and contributes to the feeling of comfort and bodily ease.

From a series of experiments made by several eminent Continental physiologists, particularly Lehmann and Böeker, and which have been carefully repeated by Dr. Edward Smith in this country, the following conclusions with regard to the physiological effects of tea and coffee were arrived at:— *

1. *Tea, in ordinary quantities, has no effect upon the amount of carbonic acid gas expired by the lungs, nor upon the frequency of the respiration, or of the pulse.*

2. *When the diet is* insufficient, *tea limits very much the loss of weight thereby entailed.*

3. *When the diet is* sufficient, *the body is more likely to gain weight when tea is taken than when it is not.*

4. *Tea diminishes very much the loss of substance in the shape of urea* (*Lehmann*). *This is disputed by Dr. Smith, and apparently disproved by Squarey's experiments.*

5. *The amount of perspiration is also limited by tea.*† *This is disputed by Dr. E. Smith.*

* See 'Digestion and its Derangements,' by Dr. King *Chambers.* 1st ed. 247.

† '*Food* and its Digestion,' by Dr. Brinton. 1861.

Dr. Edward Smith demurs to some of these conclusions. His experiments, which were certainly made with the greatest care and perseverance, lead him to the conclusion that, 'immediately after tea has been taken, the quantity of carbonic acid emitted by the lungs, and the quantity of air inspired, have been increased; whilst there has been greater depth and freedom given to the respiration. It is chiefly in its power to increase the respiratory process that it acts so favourably, and in so doing the transformation of starchy and fatty food is promoted; but, in addition to this, it tends to increase the action of the skin, and, by inducing perspiration, to lessen the heat of the body. Its action upon the respiration takes place whether the infusion be drank when hot or cold.'*

These conclusions, it will be observed, are antagonistic to those of the German chemists; but I am of opinion that they are borne out by careful observation, particularly as regards their cooling effect (by increasing transpiration) upon the body. Dr. Smith further states that 'tea promotes the transformation of the other food, and enables it to be eliminated from the body' (by increasing the discharge of urea). 'When food has been taken in excess, or when it is not digested with sufficient rapidity, its action is very beneficial. But tea does not supply food, nor

* 'Practical Dietary for Families,' &c.: 1864. See also 'Philosophical Transactions:' 1859.

enable the body to live with less food than it would otherwise require.'

COFFEE.—As compared with tea, coffee has been supposed still further to retard the process of digestion, whilst it excites the pulse, and stimulates the brain in a higher degree. Lehmann states that it also diminishes the solid excretions of the body more than tea; but these effects are, as just stated, doubtful.

There are, however, individual differences with regard to the effects of tea and coffee respectively, which can only be ascertained by observation. Coffee, being the stronger beverage, and more stimulating than tea, promotes digestion with some in a higher degree, but with the majority of persons it retards it, especially if taken soon after dinner. It should always be mixed with nearly half its bulk of milk, when it becomes a real food; and, taken at breakfast, *café au lait* is one of our best importations from across the Channel.

Tea and coffee both diminish the interstitial change—that taking down and rebuilding of the materials of the bodily structure, which is incessantly going on in the animal microcosm. In other words, they make less food do the work of the much larger quantity which those persons take whose beverage is always plain water. Teetotallers are generally large eaters; that is, if they are healthy; and we shall presently see that the effect of alcohol is pretty much of the same kind in this respect as that of the more innocent beverages of the tea-table.

These beverages, therefore, are most useful to all classes of society. To the studious and active-minded they give increased mental energy and perceptive power, and to the manual labourer ability to do more work with the same quantity of food; or, if food be deficient, to endure its diminution without so much loss of muscular strength. In fine, they prove a blessing to all; cheering and soothing the ruffled spirits, blunting the edge of carking care and sorrow; enlarging the tender sympathies and emotions of the soul; whilst they enable the judgment to take a firmer grasp, the imagination to soar to its highest flights.

In consequence of their effect in retarding digestion, tea and coffee should never be taken by anyone, much less by an invalid person, *too soon after a solid meal.* The custom of handing tea and coffee almost immediately after a full dinner, is a most pernicious one. They come upon the stomach at the time when it is engaged with its hardest work, viz. that of reducing the solid food to a condition to be acted upon by the gastric juice, and to be converted into chyme. Their astringent effects, especially of coffee, are *then* most detrimental to digestion, to which they almost put a stop for a time; giving rise to flatulence, painful distension, fulness in the head, and other symptoms of indigestion which are generally attributed to the wrong cause.

For the same reasons, as already stated, what

are called *heavy teas*, that is, a meal of meat with tea, are quite unsuited to invalids and convalescents. Tea ought never to be a full meal, even in health, much less in sickness or convalescence. The tea acts directly in allaying the desire for the solid food, and in hindering its digestion. But when the system is weak, and when the body is tired, and the mind jaded by exercise or business, *then* the cup of tea *before* dinner is the right thing in the right place. It will *now* excite appetite, and, in cases of great debility, a teaspoonful or two of brandy may be added with propriety.

From two to three hours after a meal is the proper time for taking tea; then it assists in washing out the remains of the solid food from the stomach, soothes the nerves, and conduces to repose (not to sleep). It prepares the mind, by its gentle stimulus, to resume its active duties, should such be necessary, and clears away that obscuration of the ideas which persons of weak digestion always feel during the early portion of that process.

My own experience leads me much to prefer tea to coffee for after-dinner use. It is less exciting to the circulation, more soothing, but equally enlivening to the intellect. It also retards digestion in a less degree than coffee.

By the majority of persons, coffee is undoubtedly preferred to tea for the morning meal, even in this tea-drinking country; whilst on the Conti-

nent it entirely supersedes it. And I think this is reasonable. Coffee has more solidity about it; more milk and sugar, both highly nutritive articles, are taken with it; and it appears to give *stamina* for the day's work better than tea. Cocoa is, for many, equally good, if taken plain and in smaller quantity.

The fashionable custom of taking tea *between* the two principal meals of the day—the two o'clock luncheon-dinner, and the seven, eight, or nine o'clock dinner-supper—is not altogether without some warrant from physiology. In point of fact, the fashionable ladies have returned to the old-fashioned time of taking tea; viz., five or six o'clock P.M., or three hours after the old dinner-time. Thus does nature revenge herself upon fashion.

It is chiefly in the after-part of the day that the beneficial effects of tea are observed. When the system is fatigued by heat, exercise, or work, a cup of good tea is the best refresher, as when the mind is perplexed by anxious affairs, it is the greatest solace; languor of body and ennui and exhaustion of mind equally disappearing under its cheering influence. So, to the sleepless invalid, after tossing to and fro in restless misery through the long night, a cup of tea in the early dawn will soothe the irritability which has banished sleep, and probably procure the first rest he has been able to obtain.

Being a powerful nervine stimulant, coffee

should not be given to delicate subjects, or to young children, unless mixed with at least half its quantity of good milk. Otherwise it excites the nervous system like alcohol, and leaves something of the same want and depression behind when its effects have passed away.

Cocoa.—Cocoa (from the *Theobroma cacao*) contains an active principle, theobromin, which appears to be identical in composition with thein and caffein; thus increasing our surprise that three raw substances—tea, coffee, and cocoa, most dissimilar in appearance, and the produce of very widely different members of the vegetable kingdom —should each contain an active principle which is identical with that of each of the others. The effect of cocoa, however, is widely different to that of tea or coffee. Its active principle is in small quantity, and is mixed with a large quantity of starchy and albuminous substances; so much so, that it must be regarded more as a food than as a drink. It contains a large proportion of fat, and when mixed with a quantity of milk, is a highly nutritious article of diet.

And as such it should be viewed. It certainly does not possess the stimulating and refreshing qualities of tea and coffee; and it is therefore not suited for evening use. It may very properly be taken at breakfast by those with whom it agrees, as it lessens the demand for solid food. Delicate persons should be careful to use cocoa plain and fresh, otherwise it proves too heavy for the stomach,

and gives rise to flatulence and eructations. Cocoa, and the richer substitute, chocolate, are now made into cakes and lozenges, which the invalid may slowly dissolve in his mouth when out of the reach of other food. As a habit, however, this munching of little things is to be discouraged, as calling upon the digestive powers at improper times.

Alcoholic Beverages—Beer, Wine, Spirits, etc.

In providing for the invalid and weak such sustenance in food or drink as will be found most conducive to their recovery, we can afford to put aside altogether as idle all arguments which are based upon the abuse of such articles by persons in health. For this reason, I shall not enter upon the vexed question of the propriety or impropriety of advocating the use of alcoholic drinks by people in health. I shall escape from the casuistic discussion as to whether the injury to the morals of thousands by their *abuse*, does, or does not, outweigh the benefits to be derived by millions from their *use*. If it were ever likely to be possible to deprive sin and vice of their victims by putting a muzzle upon the liberty of the moral and sensible portion of the community; or if there were any chance that those who know how to use without abusing any article of food or drink, or other commodity, would consent to forego the advantages or even the gratification which they derive from that use, *then* I might join

in the discussion, fruitless and profitless as it now is, as to the propriety of denying to all the use of dangerous articles lest a few should abuse them to their own injury or ruin.

We take sharp knives away from little children, lest they should cut themselves or others; but who ever heard of forbidding their use to grown-up people, because here and there an idiot or a maniac may cut his own or another's throat with them?

The use of alcoholic stimulants, then, under which term I include, as is the custom amongst the teetotallers, all kinds of beer, cider, perry, wine, and spirits, is conceded by all except the most rabid total abstinence men, at least to invalids, the sick, and the convalescent; and in one shape or another they form a very important class of weapon in the armamenta of curative agents.

Nevertheless, it is not to be doubted that much harm, as well as good, has resulted from the use of stimulants as a *medicine* by the very class of persons for whose benefit they seem to be in an especial manner destined. If recklessness in their use works such fearful damage amongst the previously healthy and robust, how much more mischief will it effect upon the weak and shattered frames of those whose health has been undermined by disease? It is by the timely (*tempestivè*) use of any remedy, that, according to the dictum of the father of medicine himself, it becomes a

remedy at all; whilst, exhibited at improper times and seasons, it proves a poison instead of a cure, a curse instead of a blessing; and such is emphatically the case with regard to alcohol.

The principles upon which fermented and distilled drinks are to be used should be well understood; and unless they are used in conformity to some well-ascertained general rules, the invalid would have to consult his medical adviser every time he wished to take a glass of wine.

PHYSIOLOGICAL EFFECTS.—The physiological effects of alcoholic drinks upon the system closely resemble *in kind* those of the milder infused beverages—tea, coffee, &c.—only they are produced in a higher degree from smaller quantities. There is the same exhilaration of the spirits; the same brightening of the intellect; the same temporary increase of energy in the muscular system; whilst the digestion also receives a fillip, and the feeling of physical well-being is enhanced. *This from a small quantity judiciously administered.* I am not here to speak of those cases of severe disease in which the prostrated patient almost lives upon alcohol, and in which the largest quantities are given to produce the desired effect; although the propriety of the practice may be, and has been, called in question. These must be left entirely to the care of the physician as exceptional cases. The valetudinarian and convalescent can only proceed safely within much more moderate limits; nor is it necessary or allowable that he should enlarge

this boundary from time to time, as the enemies of alcoholic drinks pretend. If this were so, their use would have to be given up by a large number of sober and temperate consumers of them.

I have elsewhere stated, that the taking of *frequent* small quantities of any alcoholic beverages is to be discouraged in the healthy, as a hurtful practice; inasmuch as it does not allow time for the effects of one potation to pass off before another is taken. This precept may require modification in the case of invalids. *They* take them for the stomach's sake; to promote digestion; and more frequent doses are therefore sometimes allowable.

PRINCIPLES OF USE.—In laying down a few principles by which the invalid may regulate for himself the supply of alcoholic beverages, we have to search among the conflicting testimony of observers and experimenters as to the actual physiological effects of these liquids upon the vital chemistry of the body. And it is only after careful study of that which has been advanced on both sides of the question, and much observation at the bed-side of the sick, that I venture to direct attention to their effects upon the DIGESTIVE ORGANS as the *sole* criterion whereby to judge of their suitableness, or unsuitableness, to each individual case.

What is it that the drunkard dies of? He gets diseased liver, heart, kidneys, brain, from his long-*continued* potations; and he gets also delirium

tremens either before or after these diseases have taken place. But it is not they that kill him. No; he dies of starvation—of starvation in the midst of plenty; of exhaustion of the vital forces for want of proper supplies of nourishment. Whilst he has been daily, hourly, applying the spur to the tired horse, heat to the empty engine, he has neglected to give them that food in the one case, and water in the other, out of which only they could renew their respective powers, and supply the loss occasioned by the play of their various functions The drink poisons him. And what is poisoning? Depriving the centres of nervous energy of the power to react upon the various organs of the body, by which deprivation the functions are brought to a standstill. Remove the poison, and the functions will renew their play; as we see daily exhibited in the case of chloroform, and in recovery from diseases in which a morbid poison has been circulating in the blood.

So, then, in using alcohol as an ally, we must be careful to prevent its becoming our tyrant. Like fire, it is one of the best of servants, but a terrible master. We must be careful to restrain its action within the proper bounds; to keep it directed only to the stomach and digestive functions, and to prevent it from mounting to the brain, and there, by over-exciting, exhausting its energies. There must be no *poisoning.*

Alcohol is generally accounted to be a stimulant. But, then, what is stimulation? If you

reply, the operation of a stimulating substance upon the frame,—you only change the words without elucidating the meaning; and to say that alcohol is a stimulant because it excites the circulation, only begs the question asked. For alcohol may have more kinds of action upon the frame than one. And this is just what the truth is. It is both a stimulant and a sedative, or narcotic. It excites to increased action; again, it reduces that action below the normal degree. It both increases and lessens appetite; it both enlivens and stupefies the brain; and all according to the quantity taken, and the manner of taking it. Such a quantity as will prove to one individual powerfully narcotic, will scarcely affect another, or only slightly elevate him.

And do we not meet with the very same difference in the operation of all other powerful agents, medicines in particular? They are useful remedies, or deadly poisons, according as they are temperately or recklessly used. Opium, in small doses, stimulates and enlivens; in large ones it deadens and destroys. Even our very food partakes of this double character. A moderate allowance is easily digested, and proves serviceable to the system; whilst excess often proves as poisonous as the deadliest drugs.

The first effect of alcohol, in the shape of beer or wine, is made upon the stomach, and to this organ, I repeat, we must mainly endeavour to *restrict* its effects. Small quantities taken just

before solid food, or, what is generally better, along with it, excite an increased secretion of gastric juice, and rouse the languid vessels and nerves of the stomach to increased action. When the individual is very weak, he is frequently unable to digest any solid food until the stimulant has been given. When mixed with the food, the stomach resents its presence less than at any other time, and absorption is slower; so that it does not affect the head so rapidly. We constantly hear very debilitated persons complain that they cannot take a single glass of wine, on account of its mounting to the head so quickly, causing giddiness and a feeling of semi-intoxication. This is a sure indication that the stimulant is required, but that it is not taken in the proper way. Let one-half, or even one-quarter, of the quantity be given *every* time food is taken, and then it will be tolerated, until the *circulation* becomes stronger, when its presence will be more readily borne.

Thus, the old-fashioned custom of giving rum-and-milk the first thing in the morning to great invalids, although much abused by those who had no need for stimulants, was founded upon sound principles. It was mixing the stimulant with the food, and with food of a highly nutritious kind. In cases of great debility, this is as good a way of giving stimulants as can be followed.

TIME FOR TAKING THEM.—The proper time for taking alcoholic stimulants, *as a rule,* is with the two principal meals of the day—say, dinner or

supper; or, if dinner be taken early, at luncheon and dinner; *never in the morning.* All tippling between meals must be avoided; at all events, so soon as the first debility has passed away. *Sound* wine will prove provocative of appetite if taken just before or at the commencement of a meal; whilst, if taken some time after, wine only interferes with digestion, causing flatulence and uneasiness.

If wine be taken *without* eating, it should be of the lightest description, and such as possesses enlivening qualities with but little alcohol. Sparkling moselle, champagne, or burgundy, or even light bitter beer, are far preferable to the full-bodied port, which is so often given under the idea of its strengthening qualities. The large quantity of alcohol contained in the stronger wines produces an immediately stimulant effect upon the brain and heart; and this, when there is no food in the stomach to be digested, is a hurtful one.

WINE.—The effects of wine, &c., being first spent upon the digestive organs, it is of the greatest importance to select those of good quality; for upon this will it depend whether they will assist the stomach in the performance of its duties, or clog and retard its efforts.

The old-fashioned division of wines into sweet and dry, is a very good one for our purpose, because it enables us to set aside all those which *contain* unconverted sugar, and those which possess

a large amount of free acid as unsuited to the invalid's use in the majority of cases.

QUANTITY OF ALCOHOL IN WINES.—The most important constituent, however, of wine, beer, &c., is alcohol; and I shall therefore enter, in some detail, into the various analyses which have been made to determine its amount.

Table of the Quantity of Alcohol contained in various Wines, and other Alcoholic Liquors, from BRANDE, PROUT, AND HENDERSON.

	Pr. ct. by measure
Port, avrge. of 7 specms.	22·96
Do. „ „ „	20·64
Madeira „ 4 „	22·27
Sherry „ 4 „	19·17
Do, very old	23·80
Claret, aver. of 3 „	14·43
Calcavalla	18·10
Lisbon	18·94
Malaga	17·26
Bucellas	18·49
Madeira, red	18·40
Malmsey	16·40
Marsala	17·26
Champagne, red	11·30
Do., white	12·80
Burgundy	14·57
Do.	11·95
Hermitage, white	17·43
Do., red	12·32
Hock	14·37
Do.	8·88
Palm Wine	4·70
Vin-de-grave	12·80
Frontignac	12·79
Côte Roti	12·32
Roussillon	17.26
Cape Madeira	18·11
Cape Muchat	18·25
Constantia	14·50
Tent	13·20
Sheraaz	19·80
Syracuse	15·28
Nice	14·63
Tokay	9·88
Raisin	25·77
Grape	18·11
Currant	20·55
Gooseberry	11·64
Elder	9·87

ALE, PORTER, &c.

Edinburgh Ale	7·10
London Porter, strong	6·75
Do.	5·
Small beer	4·
Light Table beer	4·50
Burton Ale (Bass)	7·50
Do.	7·
Do. Pale	5·
Dublin Stout	4·75
London	4·75

SPIRITS.

Some analysts make one imperial pint contain of absolute alcohol—whisky 7·63; brandy 7·4; rum 7·1; gin 6·3.

Dr. Bence Jones gives the percentage of absolute alcohol in brandy and whisky from 60 to 70 per cent., in rum 60 to 77, and in gin 49 to 60 per cent., which is probably the nearest approach to accuracy.

The following Table of the quantity of alcohol in various wines, is taken from Dr. Parkes' admirable 'Manual of Practical Hygiene for the Army,' 1864. It is made up from later analyses than those of Prout and Henderson, and includes the accurate researches of Mülder, with the observations thereupon by Dr. Bence Jones. It will be seen that this Table gives the range of various specimens, and therefore can only afford an approximative answer to the question—how much alcohol does any particular specimen of wine contain?

	Pr. ct. of alcohol in volume
Port (analysed in England)	*16·62 to 23·2
Sherry „ „	16· „ 25·
Madeira „ „	16· 7 „ 22·
Marsala „ „	15· „ 25·
Bordeaux Wines (mean of thirty determinations of different sorts—Chateau Lafitte, Margeau, La Rose, Barsac, St. Emilian, St. Estèphe, &c.)	6·85 „ 15·
Bordeaux Wines, white (mean of twenty-seven determinations of sorts—Sauterne, Barac, Bergerac, &c.)	11· „ 18·7
Rhone Wines, red (Hermitage, Montpelier, Frontignan, &c.)	8·7 „ 13·7
Rousillon	11· „ 16·

* Some port in the Queen's establishment contains only 16·62, and the highest percentage is 18·8 (Hofmann). The sherry contains only 16 per cent., and the claret 6·85 to 7· per cent. (*Note by* Dr. Parkes, 'Manual,' &c.)

	Pr. ct. of alcohol in volume
Burgundy, red (Beaune, Maçon)	7·3 „ 14·5
„ white (Chablis, Maçon, Beaune)	8·9 „ 12·
Pyrennean	9· „ 16·
Champagnes	5·8 „ 13·
Moselles	8· „ 13·
Rhine Wines (Johannisberg, Hochheimer, Rudesheimer, &c.)	6·7 „ 16·
Rhine Hessian Wines (Niersteiner, Leibfrauenmilch, Oppenheimer, &c.)	10·2 „ 45.
Wurtemberg Wine	10·
Hungarian Wine	9·1 „ 15·
Italian Wine	14· „ 19·
Syria, Corfu, Smyrna, Hebron, Lebanon	13· „ 18·

'So various is the amount of alcohol in wines from the same district, that a very general notion only can be obtained by Tables; and a sample of the wine actually used' (where strict accuracy is required) 'must generally be analysed.'

'To tell how much pure alcohol is taken in any definite quantity of wine, measure the wine in ounces, and multiply it by the percentage of alcohol with a decimal point before it.

'Example.—Wine drank being 9oz., and the percentage 13, then 9 + ·13 = 1·17oz. of absolute alcohol.' (Parkes, op. cit. p. 224.)

The amount of alcohol in the vinous beverages will be seen from the foregoing Tables to range from little more than 6 (light claret) to upwards of 25 per cent. (raisin). But it is pretty certain that the enormous quantity of alcohol in some of the stronger wines prepared for the *British* market, as ports, sherries, madeiras, capes, &c., is owing to the addition of brandy, as is the case with the

hot, fiery, home-made wines. The proper fermentation of the grape never yields, it is said, *over* 17 *per cent.* of alcohol;* therefore, all above this must be *added*; and the analyses of samples which are the most likely to be pure, as those in Her Majesty's establishment, confirm this assertion. The finest kinds of wines, and those of purest manufacture and richest aroma, and therefore least likely to have been tampered with, are weak in alcohol—6 to 12 per cent.—whilst the wines supplied for common use, to public-houses, &c., are doctored with coarse brandy and burnt sugar to an enormous extent, until almost all trace of the original wine is lost.

However, thanks to the Anglo-Frankish treaty, and the diffusion of hygienic knowledge amongst at least the more educated portion of the community, much lighter wines are now in general use than formerly. Several of the light French and Rhenish wines, which are now so fashionable, do not contain more than from 6 to 9 per cent. of alcohol; thus exceeding only in a small degree the strength of our common malt liquors.

Bouquet.—It is known to connoisseurs that the stimulating, or rather the exhilarating, effects

* 'Mülder quotes Guijal to the effect that *pure* port *never* contains more than 12·75 *per cent.* of pure alcohol: but Mülder doubts this. Dr. Gorman stated before the Parliamentary Committee that *pure* sherry never contains more than 12 *per cent.* of alcohol, and that 6 or 8 gallons of brandy are added to 108 gallons of sherry.' (Note by Dr. Parkes.)

(for there appears to be some difference between these two actions) of wine are not to be measured by the proportion of absolute alcohol contained in them. There are other principles of a volatile nature which give the bouquet or flavour to wine; and these vary in every kind of wine, and, indeed, in almost every individual vintage. The higher and more volatile and evanescent the bouquet of any wine, the more rapid appear to be its effects upon the system, although those effects may pass away with almost equal rapidity. The late Dr. Paris attributed a great part of the powerful effects of certain high-flavoured wines upon the nervous system to these etherial substances. He thought that they would prove to be new chemical principles; they are now, however, known to be various kinds of ether formed from the organic acids; some of them are called œnanthic, as belonging to wine; others citric, tartaric, malic, racemic, butyric, &c. The bouquet may also be affected in some measure by the various extractive and albuminoid substances contained in all pure wines.

Sugar.—The other qualities of wine, besides the amount of alcohol, which it concerns the invalid to take account of, are the quantity of sugar, and of free acid in them.

Most of the stronger wines, as those of Portugal, Spain, Madeira, Italy, contain a considerable quantity of sugar; whilst the Rhenish wines, Hock, Moselle, and the Bordeaux and Burgundy wines, contain but a very small quantity, and the

best are altogether free from it. Strong sherries all contain sugar, averaging about 8 grains per ounce, according to Dr. Bence Jones; Madeiras, also, varying from 6 to 66 grains per ounce. Marsala contains less; whilst port varies from 16 to 34 grains in the ounce, being apparently greatest in the finest wine. The light, bitter sherries, Amontellado, Manzanilla, &c., contain a very fractional amount of sugar, and are therefore essentially *dry* wines. Champagne has a good deal of sugar; Moselle but little, if any.

Free Acids.—The free acids contained in various wines are derived from the grape itself, whilst much of the sugar is added to cover other deleterious mixtures, or to disguise the brandy. It is from these acids that are formed the ethers which give the bouquet to wines; and therefore they abound the most in wines of highest flavour, such as new port, and the wines of France and the Rhine. These acids are chiefly tartaric (as equivalent to which they are generally reckoned), acetic, racemic, malic (the acid of cider and perry), tannic (in clarets, port, &c.), glucic, lactic, &c.*

The following Table gives an approximate estimate of the amount of free acid in several wines.

* Dr. Bence Jones, in the Appendix to his edition of Mülder on the 'Chemistry of Wine,' states that he found *no* sherry, port, madeira, or champagne, that did not contain sugar; and no claret, Burgundy, Rhine, or Moselle wine (except one sample of *Sauterne*), which was not *free* from every kind of sugar.

QUANTITY OF FREE ACID IN VARIOUS WINES.

	Equivlnt. of tartaric acid per oz.
Acid French Wines	10 grains
Common Claret	6 „
Best do. (Lafitte)	4 „
Rhine Wines	4 to 7
Champagnes	4·8
Port	4 average
Sherry	4 to 5

The determination of the free acidity of wine may be made approximatively by *dry* carbonate of soda, noting the quantity required to neutralise a given measure, as an ounce, of the wine to the point when no further effervescence takes place.

The quantity of the sugar must be judged of by the palate, by the acidity left in the stomach, by fermentation after drinking the wine, or by chemical analysis.

Formerly, it was the custom to call the wines of certain districts or countries sweet, or dry, or acid, as the case might be. More recent experiments have now shown that this classification is not exact, and that the determination of the quantity of alcohol, of free acid, and of sugar, must be made for each vintage, as the greatest differences, both natural and *artificial*, exist in the composition of wines from the *same* district.*

Some wines must be excluded from the invalid's dietary altogether. These are the sweet, luscious wines so much in vogue in former times; as Malmsey, Lisbon, Constantia, Tent, Tokay,

* Parkes, op. cit. p. 225.

Cyprus, &c. They all contain so much unconverted sugar, that no dyspeptic, gouty, or rheumatic person could safely partake of them.

Sparkling Wines. — The sparkling wines, champagne, moselle, sparkling hock, and burgundy, are so various that they can be made into a class as immediate stimulants only in reference to their effervescent character. Claret, burgundy, moselle, and hock, being dry wines, are to be preferred to champagne, except when a very powerful and sudden stimulant is required. But the stimulus arising from sparkling wines is rather illusory and transitory, being only due to the rapid manner in which, aided by the carbonic acid gas, the aroma of the wine is carried to the nervous system. Brandy should be added when they have to be used in the last extremity of collapse or exhaustion.

Dry Wines.—What are called the light dry wines, such as Rhenish, claret, burgundy, hermitage, bitter sherry, &c., are undoubtedly the most wholesome for general consumption by invalids and persons of weak stomach. They contain but a moderate amount of alcohol, and may be so chosen as to present the least possible acid or saccharine properties, according to the requirements of each individual case. The Tables given above, which may be relied upon as affording us the most exact information which we at present possess, will enable the invalid, or his medical adviser, to choose such a wine or wines as will be

most suitable to his idiosyncracy and habit of body. If in dyspepsia there be a tendency to acidity of the stomach some time after taking food or drink, then those wines which contain unconverted sugar must be excluded: whilst a little free acid will be less objectionable. Moselle, good claret, burgundies (some of them), and dry bitter sherries, are the best wines now obtainable, since madeira is a thing of the past. They are freest from sugar as well as from acidity, and contain alcohol only in moderate amount. Stronger sherry is tolerably free from acidity, but then there is a good deal of sugar. Ports, except the best, are to be excluded altogether.* Where the smallest quantity of sugar in wine turns to acid in the stomach, we must fall back upon weak spirits and water.

* The old-fashioned notion, based upon ignorance, that claret and Rhenish wines are cold, acid, and likely to disagree with the English stomach, is now happily fast passing away. Entirely forgetful of the time when claret was the ordinary wine of this country, and of the opposition which was made to the introduction of the 'nasty' wine of Oporto when Pitt set up his protection of Portugal, the port-wine bibbers of the last generation lived and died in the fond belief that it was the only fit wine for an English gentleman's drink. Perhaps it was the out-of-door and unstudious life they led, giving them the digestion of an ox, which enabled them to carry off their daily potations of two or three bottles of port. Certainly it seems incredible to us of the present day how they did *carry them off*. Yet even the very men who, thirty years ago, drank their two or three bottles, now flinch at half a one; nay, some of them cannot take three glasses. There comes a time when they have to give up their

In the Rhenish countries, their lighter wines are looked upon as diuretic, and this is a quality which many of them possess, especially such as contain a good deal of free vegetable acid. This quality may be taken advantage of in a feverish and gravelly, or gouty, state of the system. Claret and water, or still hock, will be found serviceable in this regard; whilst champagne and burgundy are sometimes diaphoretic.

DISTILLED SPIRITS.—Are distilled spirits to be considered as forming part of the invalid's commissariat or no? Although by means of a proper and judicious selection of wines, the use of pure spirits may be reduced to a minimum, it does not appear that we can well do without them altogether. Cursed legacy as they have proved to mankind, having them, we may as well seize the good they afford, whilst we hope that the advancing knowledge of the pernicious' effects of their *constant* use will, in time, make that use as exceptional as, unfortunately, it now is the rule.

Brandy, gin, and whisky differ in their effects upon the system, and should not therefore be used

port, they say. Yes; and there has come a time when port is no longer the proper drink for them, or their descendants. The lessened powers of digestion, the greater extent of education and intellectual exertion, and in-door occupations generally, have deprived *our* stomachs of the power *to put away* these two and three bottles of port wine, topped up as they were with a few glasses of sherry, or two or three tumblers of punch. Port! thy *days are* numbered. *Requiesce in pace!*

indiscriminately. Brandy may be substituted for wine in the case of great exhaustion; when the patient is unable to swallow any but the smallest quantities; in sickness of the stomach, when wine would be rejected, or when it turns acid after being taken. It should always be taken diluted in proportion to the rapidity of the effect required of it. If for the purpose of a stimulant only, it should be given hot; if to promote digestion, cool or cold. In great sickness it may be iced with good effect. When the liver is inactive, brandy should be very sparingly used, as it appears to check the flow of bile. Whisky has a diuretic, a stimulant, or a diaphoretic effect, and agrees with most people who can relish the flavour of it. It is less injurious, for a continuance, than brandy. Gin is only useful as a diuretic, but its stimulating action is very inferior to that of any of the other spirits. Rum is unsuitable to invalids, on account of the large quantity of sugar and extractive matters contained in it.

Beer.—The light bitter beer now so generally used is also a step in the right direction, as compared with the strong ales formerly in use. They are better suited, perhaps, to those who are able to be much in the open air, than wine; and upon the whole, they appear to assist digestion in a more permanent manner. This is no doubt due to the large quantity of hops which is now used in brewing this kind of beer, the bitter principle of which is a direct tonic.

It is also a narcotic; and this necessitates caution in prescribing bitter beer where there is a tendency to head-ache, fulness of the vessels, or a short apoplectic conformation of the head and neck.

Bitter beer, like wine, should be taken at meals, as a general rule. At all events, it appears to me that ill effects often result from imbibing bitter beer at odd hours of the day, even in moderation, when no food is taken. The bitter principle is provocative of appetite, and therefore there should always be something taken with it to digest, such as a sandwich or a few biscuits.

The alcohol in beer is so well blended with the extractive* and albuminous matters of the malt, and with the bitter principle derived from the hop, that even when large in quantity (and it often exceeds that of the lighter wines), it intoxicates less, and acts upon the nervous system in a slower manner. If this slowness comprehends *permanency*, then beer is undoubtedly a better tonic than wine, and common experience proves that it is so. When we want a permanent strengthening action, beer or porter should be always used if it is well borne; reserving wine as a temporary stimulant to the action of the stomach upon the food. Thus beer is said to be most suitable for

* 'All kinds of ale, porter, and stout contain much glucose (grape sugar). Hard cider is free from sugar; sweet cider contains *uncrystallisable* sugar.' (Dr. Bence Jones on Mülder.)

body workers, wine for brain workers; and there seems to be some truth in the saying.

Many invalids who cannot take wine, on account of it so rapidly mounting to the head, will bear mild bitter beer taken with their meals; and after a time, they may pass on to porter.

PORTER.—The great *abusers* of porter are women of the higher and middle ranks of society. One stares to see the tumbler after tumbler of porter or stout which some ladies declare to be necessary to *keep them up*. Much of this abuse is owing to the fashion of ordering it so recklessly to suckling women; who also declare that, without it, they should have no milk at all! How does it happen that the wet nurses they procure from the lower classes suckle so well without porter? The poor women declare that *they* cannot suckle without their tea! So it is a stimulant in either case that is thought necessary. Why will they not try milk? The fluid identical with the one they wish to make is seldom used; yet if beefsteaks are used by the athletes to make muscle, by parity of reasoning, cows' milk should be as readily convertible into human milk; and those who have had the courage to try it find it to be so.

But the stimulant is needed on account of the artificial habits in which the suckling mother of the better classes indulges. The high-seasoned food, the strong tea, coffee, &c., the heated rooms, and, above all, the mental excitement, and absence of quiet and fresh air; these things heat the

system, and create a feverish state of the vessels and fluids of the body which is antagonistic to secretion; and so it comes to pass that the poor countrywoman, fed on the poorest fare, and drinking only water or weak tea, but with fresh air and freedom from care and mental excitement, has an abundant breast of milk; whilst that region in the fashionable London lady is a sealed fountain whose spring is forced back to its source.

It must be understood that the allowance of wine or beer which may have been made to the invalid or convalescent to assist a weak digestion, must be gradually reduced as he approaches to his usual health. So soon as the digestive powers have recovered sufficiently to cope with a natural quantity of solid food, without giving rise to pain or other dyspeptic feelings, the artificial stimulus ought to be wholly or nearly withdrawn. But when nervous and feverish excitement has produced rapid disintegration of the tissues, then will alcohol in some shape—beer, wine, or spirits—be useful to check the metamorphic action, by saving the tissues of the body from being burnt up for fuel, and by reducing the loss of substance within the supplies of solid food which the patient is able to take. It *then* saves food; saves the work of the stomach; and becomes an ally of the greatest value. But when proper supplies of food *can* be taken, or whilst the system is full of effete and metamorphic matter, the alcohol will *be apt to* operate as a further poison; and de-

pression, loss of appetite, and general disturbance of the functions will most probably take place.

But whilst the frame is still subjected to the same depressing circumstances which occasioned the illness in the first place, as bad air, malaria, confinement, over work, or anxiety of mind, or chronic disease become active, we must in no case withdraw the stimulants which have been found of such service in the acute stages of the disease. Probably it is the nervous system which has suffered the most; and it is to it that alcohol directs most of its forces. If the tired frame *must* be spurred onward; if the anxious cares cannot be removed, give the glass of beer or wine, but always with a *little* food. You thus make the alcohol to conduce to two good actions, viz., assisting the stomach in its duties, and rousing the nervous system to fresh energy.

The case for *increasing* the supply of alcohol is that in which the nervous force is failing, whilst the digestion can render no assistance.

I am well aware that, in the foregoing remarks on Diet in general, I am far from having exhausted the subject. Of all the natural agents which affect the health, comfort, or life of the invalid, there is none of so much, if of equal, importance as diet. If errors are committed systematically, the mischief arising from them may be interminable in its effects, inasmuch as the very structure of the body will be affected by it. Every organ draws its *powers from* the supply of blood sent to it, and

it will depend upon the healthiness or unhealthiness of this fluid whether its functions shall be performed in a normal and beneficial manner, or in an abnormal and destructive one. The blood derives its pabulum and its purity from two sources—the food and the air—the imperfection of either will pervert its composition; whilst that of both will prove, in a longer or shorter time, utterly destructive to its vitality. The ramifications of the subject are therefore almost infinite.

I have purposely abstained from indicating any special diets for individual diseases, for two reasons. First, because it has always appeared to me that to give minute directions, either in regard to food or medicine, to the public, with a view to enable them to treat themselves, in disease, is bad in principle, and, in the end, injurious to those whom it is sought to benefit by them. It is impossible thus to make 'every man his own doctor.' And, secondly, because the only parts, both of physiology and of the management of disease, which it is either possible, or desirable, to teach the public, are certain broad principles wherewith they can come *in aid* of the physician, by giving an intelligent account of their symptoms, and by noting the effect of the operation of food, medicine, &c., upon them.

CHAPTER III.

CLOTHING, EXERCISE, BATHING, SLEEP.

Section I.—Clothing.

In health, as everyone knows, there are two objects to be attained by clothing. The first is the retention of the warmth of the body; and the second, protection from the heat of the sun, and from rain, wind, dirt, and other noxious agents.

The clothing of the invalid must undergo modification to suit the varying circumstances in which he may be placed with respect to the two above-named objects; and it will behove him to consider which of them chiefly deserves his attention. In the majority of cases it will prove to be the first.

The invalid, and especially he who is suffering from chronic disease, or is slowly recovering from the attacks of more acute disorder, is placed much upon a par as regards the evolution of animal heat with children and aged persons. He is thrown back some degrees in the scale of vitality. Such persons do not produce so large an

amount of animal heat as stronger and healthier subjects; and this is the reason why it is so desirable that what they do make should be husbanded as carefully as is possible.

A neglect of this precaution will result in congestion of some of the internal organs, or an attack of catarrh, rheumatism, gout, or neuralgia, which are generally the consequence of the body receiving a chill whilst the blood is in an impure state.

UNDER-CLOTHING.—Every invalid should wear under-clothing of good quantity and quality; the garment worn next the skin should be of at least three-fourths wool, the rest may be cotton or silk. It should be thicker or thinner according to the temperature of the season, but must *never* be left off altogether. It will not do to be content, as many are, with wearing a piece of flannel, or a hare's skin, or wash-leather, over a portion of the chest *in front*; not one-half of the chest is covered by this means, and the other parts of the trunk require to be equally protected with the chest. Indeed, the flannel or merino vest and drawers (ladies have a convenient garment in which these two are combined) should together cover the whole of the body, from the wrists and collar-bones to the bottom of the calf of the leg.

There are a few persons whose skin is so delicate that they cannot suffer flannel next to it. Some of these wear spun silk next the skin in place of flannel, but it is not a good substitute. It is too

close in texture to be a good absorbant material, and consequently the perspiration is not conveyed from the surface of the skin to the outer air with the necessary facility. In such cases, a soft fluffy cotton may be worn, which will prove next to wool in its hygroscopic, or water-absorbent property.

The under-garments must be more frequently changed by invalids than is necessary for those in health. The exhalations from the skin of the former are generally more loaded with offensive matter, and it is better, both for themselves and for others, that they should be removed with most scrupulous care. Woollen under-clothing should not be worn longer than three or four days without its being, at least, well dried before a hot fire to draw out the animal matter.

Outer-Clothing.—But whilst we take measures to preserve the animal heat of the body, we must be careful not to overburden the weak frame of the invalid with too great a quantity of clothing, which will oppress him by its weight, and excite an undue amount of perspiration. Many colds are caught and relapses produced by want of care in this respect. The patient gets into a perspiration, and then if he sit down to cool, even with all these clothes on, he speedily feels chilly from the evaporation going on after exercise has ceased.

We may attain the object of warm clothing without much increasing its weight by wearing a larger number of light garments, one over the other; and the number of these can be reduced at any time

without the same danger of taking cold as when a thick and heavy coat or shawl is suddenly laid aside. A shirt of fine flannel may be worn over the vest in winter, and then the number of coats, &c. required will be reduced. 'I wear my great coats next my skin,' was remarked to me by a hale octogenarian, who, on a bitter cold day, was walking out in a thin dress coat only. He had on *three* flannel shirts, one over the other.

Colour.—The colour of clothing is of importance. In winter, in this climate, we require such a texture and colour as will absorb all the rays of the watery sun which our bodies can collect, particularly whilst taking passive exercise in an open carriage. For this object black is the best colour; then blue, purple, red. Black absorbs heat the most, and reflects it the least. In summer, light colours should be worn for the opposite reason, since they absorb little heat, and reflect much of it back again.

Both in summer and in winter the materials of the invalid's dress should be chiefly of wool, light and porous if you like, or mixed with a small portion of silk or cotton, but still chiefly of wool. There is even a greater necessity for a substance which readily absorbs the moisture of the body in the summer than in colder weather, because there is then more *sensible* perspiration going on, and the condensation of this upon the skin gives rise to chill during its subsequent evaporation. Hence colds, rheumatism, &c., are nearly as frequent in *summer as* in winter.

Windy weather must be especially guarded against by the invalid by attention to his clothing. Instead of the numerous *thin* garments recommended above as generally the best for him, inasmuch as they enclose between each layer a stratum of warm air, varying in temperature from that of the body to that of the outer atmosphere, a thick close-textured cloak or coat should be fastened close up to the chin to prevent the wind from entering between the layers of clothing, and so robbing the body of its heat.

Something more than the ordinary clothing must be worn for going out when the temperature of the air falls below 50° or 55° in winter and spring, and 60° in summer and autumn. Particular individuals must modify this to suit their own feelings; but in *all cases* care should be taken not to suffer an *abiding sense of cold* to remain. During merely passive exercise, or the slow walk of a weak person, congestion of some internal organ will be the sure result of neglect in this respect.

For sick and delicate children the question of clothing is of an importance second to that of no other hygienic matter. Yet how often do we see the most obvious precautions neglected here? After the severest blood diseases—measles, scarlatina, hooping-cough, &c.,—as soon as the little patient has surmounted the obvious symptoms patent to every eye, but whilst still undergoing the eliminative stage, in which nature is actively

engaged in discharging the effete and poisonous matter which she has brought together to one or both of those common sewers—the kidneys and the skin—we see children scantily clothed sent into the cold '*bracing*' air, to receive the slow death which awaits them. This is the cause of that array of *sequelæ*—those remains of disease—which kill more than the original disorder with what are called *other* diseases (but which are only the natural terminations of the primary affection under bad management), and make valetudinarians of the remainder for the rest of their lives.

Children who are convalescent from any of these blood diseases, from fevers, or indeed from any kind of debilitating disease, should go more warmly clad than usual for at least *two months* after *apparent* recovery. If their exercise causes too abundant perspiration whilst they are thus clothed, use cold sponging every morning to the whole surface, and reduce the violence of the exertion.

Old people must *always* be kept warm.

Section II.—Exercise.

If I have given the *first* place in the regimen of the invalid to diet, as being that out of which he is to rebuild his disease-shattered frame, or repair the damage of slow decay, the *second* place is claimed by *exercise*, whereby alone he is enabled to convert his supplies of food into healthy nu*triment*.

Exercise, for the healthy, is a concrete idea, compounded of the appreciation of the laws of health, and of the conditions of our peculiar civilisation. The natural man, either for the mere pleasure derivable from bodily exertion, or for the purpose of supplying his wants and desires, will generally take as much exercise as suffices to keep him in health. But in our own time, thousands, millions of human beings are obliged to earn their daily bread by constrained muscular inaction.

Not but what the poor seamstress, who in her close garret moves her nimble fingers, many thousand times through a small space, does *as much work* as the man who lifts, as the phrase is, three or four hundred tons through one foot in height in the twenty-four hours, working in the good open air; but in the latter case, with the work, all the muscles will have their due share of exercise, and absorb plenty of oxygen; whilst the muscles of the poor needle-woman, from her cramped position, will waste away, being still further starved by the foul air which she is constrained to breathe.

In a state of health, exercise and supply of food are correlative forces. The one must agree with and balance the other, or else the body will waste if the former exceed the due quantity of the latter; or it will become diseased and filled with 'foul and pestilent humours' if more food be taken than can be readily oxydised in the lungs.

EXERCISE MUST BE APPORTIONED TO STRENGTH.—Now, in apportioning exercise to the case of the invalid, it will be necessary first to consult those organs which will be called upon to do the work, viz., the lungs, heart, and muscles; just as we find it necessary to consult the convenience of the stomach before saying how much or how little food shall be taken. It is all very well for any one to say that so much exercise is necessary to such and such a person, or to such and such a condition, or to enable one to digest a certain quantity of food. But we must first enquire whether it *can* be taken; and, if so, with safety to the important vital organs which will be called upon for increased activity. The state of the muscles, also, will require to be considered.

Cæteris paribus, the invalid may take exercise up to the point of *slight* fatigue, provided it do not hurry the breathing, or cause a distressing feeling about the heart, or palpitation which does not pass quickly away. It is this caution which induces us to consider the state of various organs, both in the invalid and the convalescent —such as the lungs, heart, muscles, &c.—with reference to the effect of active bodily exertion upon them.

A. Affections of the Lungs, such as chronic bronchitis, asthma, emphysema, congestion, either of an active or passive kind, but chiefly the latter, will greatly modify the amount of active exercise which it will be prudent for the invalid to adopt;

also, whenever there are any remains of fluid compressing the lungs, or adhesions of the lungs to the ribs, the result of pleural inflammation.

In all these cases there is a mechanical impediment to the free flow of blood through the lungs. This may be caused by a degree of congestion of some portion of the lung substance, or of the mucous membrane lining the bronchial tubes; or some portions may be consolidated and impervious to air; whilst, as in emphysema, large portions may have their minute structure broken up, and permanently distended with unchanging air. If now, by means of undue exercise, the heart be induced to throw the blood upon the lungs in greater quantity, or, what amounts to the same thing, more rapidly, than they can pass it through, the congestion is increased instead of being diminished, and the work of the healthy portion augmented to a dangerous degree. By such means, emphysema is no doubt constantly increased in extent; whilst gasping, cough, headache, giddiness, and even apoplexy, are amongst the immediate inconveniences.

In these cases, what we have to avoid is setting the patient to *carry weight.* Walking up hill, by which he has to lift the whole weight of his body, clothes, &c., from the bottom to the top of the rising ground, will tax his strength more than walking six times the distance upon level ground. Speed acts in the same manner. Although, for those in health, a brisk pace is infinitely prefer-

able in walking to a saunter, in these cases the saunter is the only pace possible. Again, pace is equivalent to time. An hour's walk at a slow pace will not fatigue so much as walking a hundred yards beyond the invalid's breath.

These are the cases in which horse-exercise is so extremely valuable. Here, the invalid is relieved of the weight of his own body, except partially in trotting or galloping. He can also make sufficient motion with his limbs to gently excite the circulation without materially quickening the breathing. If he proceed beyond a walking pace, the trots should be short, if frequent; otherwise the exercise becomes violent. Cantering is the best pace, if speed is desired.

All persons who labour under any obstruction of the free passage of blood through the lungs, such as asthmatics, those who have chronic bronchitis, heart disease, &c., know the discomfort of walking against the wind. Not only does the pushing the body against this resisting medium vastly increase the labour of walking, but the rush of cold air into the lungs is injurious and even dangerous to them, from the risk of exciting congestion or inflammation. A large proportion of cases of inflammation of the lungs occur during windy weather.

If an invalid desires to walk out during the prevalence of a north, north-east, or blusterous south-west wind, he should keep at right angles to it.

For reasons mentioned above, riding in a high wind is as injurious as walking in it.

B. Those who suffer from any of the numerous affections of the heart, in most of which its powers are enfeebled, such as palpitation, feeble pulse, fatty degeneration of the fibres, dropsy, &c., must also use *active* exercise with great caution. The same feeling of breathlessness, tremulousness, tumultuous action of the heart, dimness of sight, black specks before the eyes, nausea and headache, result from over-exertion in these cases, as in those just adverted to.

Walking is good exercise when the heart is merely feeble, and not otherwise diseased. But it must not be so fast as to excite its action beyond a very little; nor so prolonged as to depress its powers by fatigue. After many kinds of illness, the muscular substance of the heart becomes enfeebled, or even degenerated; its fibres are flabby, out of tone, and irritable, on account of the bad nourishment which they obtain from an impoverished blood. In this condition of the principal organ of circulation, over-exertion may be followed by the most serious, even fatal consequences; and exercise too long continued, by calling for stronger pulsations than the heart can effect, still further weakens and exhausts its muscular fibres, in some instances to the point of giving way.

From over-exertion results dilatation of the cavities, or injury to the valves, or, more commonly, both together. Once these changes have

taken place, they are generally irremediable, leaving the patient a miserable incapable ever after.

C. A somewhat similar condition of the heart obtains after severe attacks of the specific blood diseases, such as small-pox, measles, scarlatina, diphtheria, typhus and typhoid fevers, rheumatism and gout. The poison which has been circulating in the blood has interfered with the nutrition of the heart's substance, as with that of the other muscles of the body. Its fibres are weak, irritable, and incapable of their usual exertion. Such persons feel fatigue after very slight exercise for a long time after all traces of their disease have *apparently* passed away.

In all such cases, the invalid must go slowly to work with *active* exertion. At first only passive exercise can be borne; such as gestation in a carriage, swinging, sailing, &c. Afterwards, slow walking, on *level* ground; then horse-exercise; and finally, some form of manual exertion, as gardening; or of the whole of the body, as in walking, dancing, &c. Many have been the sudden deaths amongst those just recovered from blood diseases, from *inverting* the order here laid down—by taking the more violent exercises first.

Passive exercise has *this* advantage to counterbalance its defects, as compared with those of active exertion. It is generally carried on in the open air; in a carriage or in the garden; so that as great a quantity of oxygen may be inhaled as *the supply* of food requires.

One of the very best kinds of exercise for in-

valids to commence with, is games. Here, the limbs are moved without the necessity of lifting the weight of the body; and many games can be carried on in the open air; and they also possess the immense advantage of engaging the mind in cheerful trains of thought.

Billiards, bagatelle, battledor, raquet and tennis, in-doors; and croquet, ground-billiards, bowls, archery, out-of-doors, are all so many ways of combining active with passive exercise, and are of the greatest value.

D. When the muscles are weak, as they are after an illness which has confined the patient to inaction for any length of time, there is nearly the same necessity for caution in beginning active exercise as obtains in the case of weak heart just referred to: except that improvement comes quicker, and the exercise itself, if judiciously taken, tends to cure the mischief. Many youths, however, do themselves irreparable injury by engaging in athletic games and other violent exercise before they have sufficiently recovered their strength. They, by this means, wear out the nervous energy which should feed the muscular power, and permanent weakness results. Many a boating-match, many a foot-race, or hard day's walking, has resulted in disabling their votaries for life.

Sitting out in the open air in mild weather, is by no means practised to the extent it should be. Old people and delicate children, who are too weak to take much exercise, may remain out of

doors, if properly clothed, for some hours every day when the temperature is not below 60° in the shade. They should sit in the sun when not too hot, and in hot weather, in the shade. In the former whenever it can be borne.

The dread of exposing invalids to the sun ranks with the belief in the *poisonous* properties of cold water. Let us hope it is passing away; but like all other ingrained errors, it clings like an instinct in the minds of the multitude, rising up again, generation after generation, when we had hoped it had been finally swept away.

It may appear somewhat odd to place at the head of a chapter laudatory of exercise cautions not to overdo it. But we are not now considering the case of *healthy* people, who, if they do suffer fatigue, will not be otherwise injured by an occasional excess in this respect. The danger which the invalid runs is, that having been in health, he may endeavour to get through, *somehow*, the same amount of labour as formerly; that he may think the best way of regaining the use of his limbs to be exerting them to the utmost of their powers.

Certainly, strength comes from exercise, and that of the muscles most of all. But, then, it must be judiciously taken. When the muscles have been over-fatigued, it takes a considerable time for them to recover their tone, and, if the fatigue have been great, they waste, and become soft and flabby. The weaker the system, and

the lower its powers of nutrition, the more severely will undue exercise affect both the muscular system and the heart.

These cautions given, let us now proceed to estimate the amount and kind of exercise which the invalid *may* take.

QUANTITY OF EXERCISE.—Nothing is more difficult than to lay down any precise data in this respect. Every man is an individual,—*divided* and *separated* from every other one of his species; therefore, no one person can be a judge of another's case. The system of averages is very well calculated for the deduction of general principles from a large mass of facts, for the guidance of the young, the ignorant, and those who, like prisoners and the inmates of workhouses and hospitals, are not free agents. But in other cases, each person will have to modify general rules, and, indeed, to be in a great measure 'a law unto himself.'

There are many kinds of exercise besides those which, in a medical or hygienic point of view, are called by that name. The valetudinarian in easy circumstances takes exercise for pastime or health's sake,—walking, riding, or driving in the open air,—everything which can be wished. But the poor man, the clerk or shopman, as soon as he can do a little work, must repair to the workshop, the desk, or the counter, where, although he may perchance have enough and to spare of muscular exertion, he is deprived of the vivifying influence of the fresh air. So that these latter, if

we would do them justice, must be allowed time for a walk or drive in the open air in *addition* to their in-door exercise or work; and the exertion required for the former must be deducted from what is demanded of them in the latter respect.

In fixing general dietaries for the sick in hospitals, &c., no better plan has been found than the clumsy one of halving or quartering the rations of people in health; a plan which the numerous 'extras' and deductions shows to be most imperfect. So, with regard to exercise; in taking into consideration the amount proper for invalids, that of a healthy person may be halved and quartered, with the same defects and shortcomings, however, in the system, as in the case of diet.

Mathematicians and engineers are in the habit of calculating all kinds of active exercise in the same way as that of horse or steam power, viz.,—by reducing it to the problem of how many pounds weight will the exercise lift through one foot of space in a given time.

Suppose a man's regular work is to walk twenty miles a day. This is said (Rev. Professor Haughton) to be equal to raising a weight of 353 tons through one foot of space. That is considered a good day's labour, although many working men, especially workers in iron, and men at harvest work, *occasionally* double this amount without injury. But taking (as it is assumed by Professor Haughton, and by Dr. Parkes, Dr. De *Chaumont*, and other writers on military hygiene)

400 tons lifted one foot to be a *hard* day's work, and taking walking one mile, carrying only one's clothes, to be equal to 17½ tons lifted through one foot of space, then a ten-mile walk will equal only half the day's labour of a working man. But people in health, engaged on business of almost any kind, are often on their legs for several hours a day without continuous walking; and the value of this must be subtracted from the amount as above.

Presuming that a working man might be maintained in health, by half his usual work, that is ten miles a day, or 176 tons lifted through one foot, remaining idle and inert for the remainder of the day, we may fairly consider an educated person, employed in business not altogether sedentary, would be kept in health by *half* that quantity, or from five to six miles a day; and that being a fair allowance for a person in health, we may halve or quarter it for the weak, the invalid, and the convalescent, in the same way as in the case of diet.

Half-exercise, taken according to this view, would be from two and a half to three miles walking per diem; whilst quarter-exercise may be set down at from a mile to a mile and a half. If the ground be uneven or hilly, then the exercise in a given distance is increased by the amount of the various rises added together; and is equivalent to putting a pack on the person's back, since he has to raise the weight of his body to a

greater height. This will suggest to us that the *first* walks of convalescents should always be upon level ground.

But by dividing the exercise taken into several portions, a much larger aggregate of work may be done than if it be all taken at one time. The muscles, being but slightly fatigued, soon regain their tone, especially if food be taken between the two or more portions of exercise. And, by regulating the distance gone over at one time, by the strength of the system, an invalid will often take two or three times as much exercise, without being painfully fatigued, as he would be able to do were it all crowded into one effort.

In very warm or very cold weather, verandahs and roofed sheds, under which exercise may be taken, should be provided in all hospitals, schools, workhouses, &c.

ADVANTAGES.—To speak of the advantages of exercise generally would be out of place here, as surely it would be like extolling the whiteness of the riven snow. None are so ignorant as not to know its value in promoting the growth and development of the young; the preservation of muscular force and vital energy of all the functions in the adult; the retardation of decay; and the restoration of force lost by the assaults of disease.

Whether it be strength and vigour; or nice dexterity of the mechanical powers; or perfection *and completeness* of the internal functions of

digestion and assimilation; or delicate sensation and quick perception, with clearness of judgment and freedom of fancy; all, and more than all, of these hold their excellence directly from corporeal exercise.

Equally necessary is it, with modifications, for the invalid. If he is taking highly nutritious food to recruit his exhausted forces, his exercise in the *open air* must be *exactly* proportioned to it, or it will pass into the blood in an ill-elaborated form, and prove there a source of fresh disturbance of the functions.

The enormous increase in the amount of air taken into the lungs during exercise over what is inhaled in the state of rest, and the still greater absorption of oxygen and discharge of carbonic acid gas, point out how valuable must be a process which at once greatly facilitates the discharge of effete and poisonous matter from the system, and the introduction of that element which consolidates and perfects the new and virgin materials of the body.

We may take, as a fair average, that 20 cubic inches of air are inhaled at each inspiration when the body is at rest; and the respirations of a healthy person will average about 16 in a minute. This will give $20 \times 16 = 320$ cubic inches of air entering the lungs per minute. Moderate exercise, such as walking at the rate of three miles an hour, is found to increase the quantity of air inspired, by, at least, three times, in consequence

of the increased rapidity and depth of the inspirations; thus giving no less than 960 cubic inches of air to the lungs per minute.

From Dr. Edward Smith's experiments on this subject, we gather the following ratio of respiration to exercise:—

If, in the lying position, the amount of air inspired be taken as unity = 1, then

In sitting it will be	1·18	Walking 4 miles per hour	5· 0
„ standing „	1·33	„ 6 „ „	7· 0
„ singing „	1·26	Riding and trotting	4·05
Walking 1 mile per hour	1·90	Swimming . . .	4·33
„ 2 „ „	2·76	Treadmill . . .	5· 5
„ 3 „ „	3·22		

As the exhalation of carbonic acid gas must keep pace with the inhalation of oxygen, the elimination of carbon from the system will be increased by exercise by no less than three or four times the amount emitted during repose.

It is calculated that nine ounces of carbon—charcoal—are got rid of by means of the lungs in twenty-four hours, when the breathing is tranquil. By active exercise, this may be increased *fourfold*; so that, could the exercise go on for the whole twenty-four hours, the enormous quantity of thirty-six ounces—more than two pounds—of solid carbon would be thrown out of the body. What an immense supply of food, especially of fat and starch, would be required to furnish this quantity of carbon, may be calculated from the Table given at p. 274.

But exercise must not be calculated upon an *estimate of the* quantity of carbonaceous food which

a certain amount of it would require us to pour into the system; but rather from that of the quantity which the ordinary nutrition of the body requires in order that sufficient oxygen may be received to burn up the carbon of the food for a due supply of animal heat, as well as to combine with the effete and offensive material which has done its office in the organism. If we were to force exercise, merely in order to increase appetite, to an indefinite extent, we should be using the body only as a machine for the formation of carbonic acid gas; and the machinery so overused would soon infallibly show signs of decay.

But exact calculations and experiments do show how necessary it is that the chest should have full and free play during exercise; and that there should be no hindrance by tight stays, collars, &c. to the return of the blood from the head as fast as the increased action of the heart sends it there. The limbs should also be allowed unrestrained action, that the blood may be equally distributed to every part. Headache, nervousness, and palpitation, are the result of inattention to this canon of exercise.

The secreting function of the skin is forced into greater activity by exercise. The clothing should therefore be so adjusted, as to quantity and warmth, as to allow of a moderate exudation of perspiration taking place. Neither during exercise, nor after, should the invalid be allowed to feel cold. There is no danger of taking a chill

during exercise, however hot one may become; it is allowing the perspiration to condense upon the skin *after the exercise is over* which proves so dangerous. The fact is, that the skin would still go on perspiring when the exercise is over, because the flow of blood which has been directed to it is not diverted inwards all at once, were it not for the *liquid* sweat stopping further exit from the pores.

When the invalid comes in from exercise in a state of perspiration, the under-clothing feeling damp to his skin, he should instantly repair to his bed-room, in winter—and before the fire, if there is one—rub the surface dry and warm, and then put on fresh warm flannel under-clothing. In summer, he may go to the dressing-room, and sponge the skin rapidly with cool or tepid water (70° to 82°), rubbing it warm and dry before he has put on fresh dry garments. This plan will always prevent cold much more surely than drying the under-clothes on the back even before a fire.

Over-fatigue.—Whenever, during exercise, the pulse becomes very feeble, quick, or intermitting, it is a proof that the exercise has been carried too far, even if it have not exceeded ten steps.

Cold drinks must be administered very sparingly after exercise; they are much safer *during* it. Hot tea is the best restorative known from the effects of excessive fatigue, and will excite appetite much sooner than any other drink.

The brain-worker must not despise corporeal

exercise, especially after illness. His mind will be strengthened and cleared for work more quickly by this than by any other means. The rich food and stimulants which he may be taking will be of no avail, unless the former be well elaborated into healthy blood by a due admixture of oxygen. Moreover, the free breezes of heaven playing upon the skin have a peculiar effect upon the nervous system, soothing or exciting it, according as they are gentle or brisk, soft or bracing.

Almost every invalid has some weak place, some peccant organ, which requires extra care. Debility and congestion are the two usual conditions of it; and as no machine or material can be stronger than its weakest part, the same law extends to the human machine as regards both its mechanical and vital forces. If the powers of any organ—lungs, heart, stomach, liver, kidney, brain—be reduced by disease, organic or functional, over-excitement of them will always cause *congestion* on account of the debility of the vessels and nerves in the affected organ. If, therefore, you call for too much exertion of the weak organ, you defeat the object you desire to gain—viz., increase of vital force—and produce an increase of weakness corresponding to the undue excitement. Congestion is now favoured in that organ, and by the sluggish passage of arterial blood through its tissues, its nutrition will be reduced, and permanent debility the certain result.

Let these facts be applied by all those who are

over-anxious to get to work after the inertia of illness, and by invalids who are desirous, and who perhaps feel capable, *quoad some of their organs*, of resuming the amount of labour which they performed in health. Let them sink into the minds of employers of labour also, who think that as soon as a workman can leave his bed he is capable of doing a day's work. Let them commend to the minds of the benevolent the great good which would result from the establishment, on a large scale, of convalescent hospitals, where the feeble convalescent from illness or injury would have a chance, which the rich can always command, of recruiting the tone of his muscles and restoring the powers of his vital organs, before he is turned out to face the hard fare, and the harder work of earning his own and his children's bread.

We know that if we drive our inanimate machinery—steam-engines, &c.—too fast, we shall loosen some of the rivets, or crack some of the plates, in time; how much more mischief must result if the rivets be already loose, the plates already cracked! So, when the vital organs of the human machinery are reduced to half or quarter power, how can we call upon them for their full quota of work, without being, perhaps ignorantly, perhaps avariciously, guilty of committing suicide in our own case—manslaughter, or an uglier offence, in that of another!

In every organized being, graduation is the rule

of all increase of action; the stimulus of exercise increases the nutrition of all the organs, and gradually, yet sometimes rapidly, adds to their capability of function. On the other hand, sudden demands for undue energy exhaust the very powers which make the exertion; and, in doing so, cut off the supplies by which the organ is renewed. Herein lies the great difference between the oft-quoted inanimate machine and the human body. The engine is propelled by fire and water, the machinery being a given quantity, unaffected by them, but gradually wearing out by friction. The food and water which feed our vital machinery not only have to give force to the human engine itself, but incessantly to replace its wasted substance, by which to maintain its powers during the whole period of its existence.

Section III.—Sponging and Bathing.

I have already entered at such length into the description and advantages of daily sponging of the surface in all kinds of sickness, when detailing the operations of the sick-room, that I shall restrict myself in this section to the use of cold water for sponging and bathing by the advanced convalescent, or habitual invalid, so as to obtain from them other advantages than the mere cleansing of the skin, and the excitation of its peculiar functions.

SPONGING.—There are many people who, if asked by their medical attendant if they use cold sponging, will tell him that they sponge themselves with cold water every morning. Ladies, particularly, assert this; and it is very pleasant to hear them say so, both because it is natural to us to impute purity of person as well as of mind to the softer sex, and because it is pleasant to find that those with whom we are brought into any sort of intimate relationship are thus scrupulous in regard to personal cleanliness. But how is it done? Do the great majority of even respectable persons, of the middle and upper classes, perform this daily duty in the manner in which it should be performed, and so as to obtain from it all the advantages, physical and moral, which it is capable of imparting? I think not: nay, I am sure not. Long experience teaches me that *cold* water is still dreaded, both from fear of some injurious consequences and from dread of the discomfort of its use. The discomfort of cold water! A clear proof, that expression, that they who use it know little about *cold* water at all.

This is how it is too often done. Ladies—although I allow that they are more attentive to personal purity than the opposite sex, and, indeed, so they ought to be—use cold or tepid sponging to the face, neck, arms, and bosom; these they keep scrupulously clean, but the majority of them seldom extend their operations to the lower *parts* of the body; not from want of desire to be

clean, but from a fear that cold water will be injurious below the waist. This is a great mistake. It is necessary to act upon the whole of the skin to obtain the full results of cold water. Each part of the skin sympathises with every other part, and so, if the whole be not properly cleansed, it will affect the purity of the entire surface.

An occasional warm sitz-bath, then, is made to do duty for the lower half of the body, from fear of cold. So far, however, from fearing the cold, it is the *cold* which is to be of such immense service to them. Every woman not actually ill of any disease, may take the cold sitz-bath every morning, and sponge the whole of the body, not only without injury, but with the best results. It removes debility from the internal organs; strengthens the back; gives tone to the vessels and nerves; wards off that pest of young girls, hysteria; and prevents consumption, bronchial complaints, sore throats, and affections of the voice. There is also good evidence to show that it promotes fertility in the married by removing the debilitating causes of sterility; whilst it tends to prevent hæmorrhage, abortion, and the other results of debility of the reproductive system.

For young girls, the use of the cold sponge bath every morning is unequalled by any other hygienic measure, save, of course, pure air and proper food. It retards the too precocious development of puberty, so often the life-long bane, physical and moral, of the sex; it strengthens the

muscles of the back, which the modern system of education tries so much; it prevents those irregular and unmanageable nervous manifestations, whose type is hysteria; and it hardens against the changes of temperature.

Little children should be accustomed to the cold sponging bath from three years of age, whether they be delicate or not. It should be made an amusement for them; and, if properly gone about, they will become as fond of it as they are of dabbling in the water on the sea-shore.

For youths and men, the cold bath requires no commendation. *They* cannot be said to enjoy all the vigour of their constitutions unless they *habitually* use cold water.

Perhaps nothing shows the beneficial effects of cold water so much as the improvement it makes in the complexion. From being muddy, sallow, faded, and harsh, by the constant friction required after the sponging the skin becomes soft, smooth, moist, and of the colour of health. Hope not, however, for these beneficial effects, unless the process be properly and efficiently used. No mere wiping the surface with a soft towel or sponge will be of any avail if you wish to affect the deeper organs of the body through the agency of the skin.

A wise parent will never send a daughter to a school where baths are not provided and properly used.

On first using cold sponging or bathing after

illness, the temperature of the water must be somewhat above cold—from 82° to 86°, according to the degree of previous weakness. By carefully lowering the temperature three or four degrees each day, we soon come down to what may be called the cold bath, viz. not higher than 68° in summer, and from 60° to 55° in winter.

PHYSIOLOGICAL EFFECTS.—I have already described the process of sponging the surface when cleansing is all that is sought to be obtained. The further effects of cold applied to the surface have a physiological bearing, upon which, in order to induce the invalid to adopt its use, I will here more fully enter.

The first effect of cold water applied to the skin is a depressing one; and the extent of the depression will depend, 1st, upon the debility of the circulation; 2ndly, upon the degree of cold of the water as compared with the temperature of the atmosphere; and 3rdly, upon the length of time during which it is applied.

This is the case with the healthy. The invalid merely feels the effects of these distinctions in an extra degree. This depression is doubtless owing partly to the abstraction of the animal heat; but it is also caused by the check which the circulation meets with, and the impulsion of the blood from the skin towards the internal organs, as well as by a certain paralysing effect upon the nervous system. Reaction—or a return of the blood towards the surface—soon succeeds this shock,

for, if not restrained by the continual abstraction of heat, the heart reacts against the column of blood coming to it from the surface, and puts out fresh efforts to drive it back again. The pulse, which fell from five to ten beats on entering the bath, now returns to its ordinary condition, with the exception that it is, in most cases, a little fuller.

As soon as this first reaction takes place, which may be known by a feeling of *toleration* of the water, the invalid should leave it, and commence the second stage of the process—the drying and friction. The physiological condition *now* is one of *increasing* action, both of the heart and nerves. Stimulated by the excess of blood accumulated in its cavities, the heart increases its pulsations both in rapidity and strength, whereby the blood is again equally distributed over the whole body. This is the condition which is so much assisted by friction. Whilst the heart is pushing *behind*, by rubbing and exciting the nerves of the skin they begin to pull *before*, until the blood has filled the vessels to a glowing red.

The time of immersion having been regulated by the feelings and strength of the patient—from one to three, or at most four minutes—friction is to be commenced immediately, and continued for five or seven minutes more; the surface having been first wiped dry with a *soft* towel.

The lower limbs should be first rubbed, in order to solicit the blood to the greatest distance from *the heart*, and so disembarrass it of its load. A

coarse huckaback towel, or what is called the Turkish rubber, is more effectual and pleasant to the skin than the flesh-brush, or any other very hard substance; and if diligently used, will always be sufficient for the purpose. This done, proceed to the trunk, chest, and arms, the shoulders and back being managed by a sawing motion of the towel vigorously worked by both hands. The front of the chest, stomach, and bowels, should be rubbed both ways of the skin, by which a much greater excitement of the vessels and nerves will be effected.

The principles of sponging and rubbing are the same whatever kind of bath be used. Motion and friction are equally necessary whilst *in the water*, in all cases; and the invalid must never stand with the feet and legs in cold water whilst the rest of the body is out, or whilst he sponges it, unless the water at the feet be slightly warmed. By sitting in the sitz-bath, while the legs hang over the side, he can save them from any chill, and gently wiping them over with the sponge is sufficient for them.

There should not be much dressing to do after this process, as it matters not how soon the system is invigorated by breakfast after the exertion of the bath. In weakly people, it is better taken some time after rising, when the circulation has gained a little power.

Do not suppose that, now it is all over, the effects of the sponging or of the bath are all over

also. Far from this being the case, the most valuable of them are now only beginning. The determination to the skin continues, for if the process have been properly gone through, there *is* a determination, even though no increase of heat may be felt; the increased evaporation from the surface takes off the feeling of heat which would otherwise be present. The continued flow of blood towards the skin now operates upon the organs below. *They* are relieved of their congestion; their vessels empty themselves more completely than heretofore, and fresh blood and more of it is sent to supply the place. Thus, the *nutrition* of the internal organs, which before was checked by *congestion*, is increased by renewed *determination of blood*, at the same time that their vessels and nerves recover their tone.

But the good results do not end here. There is the result of the shock, or temporary paralysis of the nervous system, to be considered. It seems to be a law particularly affecting the animal creation, in whom what is called periodicity or alternation of function is a marked feature, that a short, temporary shock, if not too severe, proves beneficial, whilst one too prolonged is injurious, and *may be* fatal. These effects result from the nature of nervous action and reaction. Give it a slight blow, one not unexpected, and it recovers, resists, and shows increased vigour; apply too great depressing force, and you may extinguish *its vitality* altogether.

It may be said, and indeed the objection has often been made, that this repeated call upon the nervous system for an extra effort must prove, in the long run, injurious and debilitating, instead of restorative and corroborating. Experience, however, does not sustain this objection; an objection further negatived by the case of the muscular system. Frequent demands of a not too exciting character upon muscular force are known to invigorate the organs in which it resides, and to prolong its endurance pretty much in proportion to the judicious extent to which they are exercised. So, the nerves receive fresh supplies of blood from the reaction of the heart, by which their nutrition is increased also; and this accounts for the feeling of satisfaction and of personal well-being which follows the proper use of cold water.

Here, then, is the rationale of the increased appetite which cold sponging and bathing produce. Stimulating the organs to *increased action* makes demands upon the blood which can only be met by a larger quantity of food digested. That beautiful arrangement by which one organ is enabled to let another know its wants, which is the office of the sympathetic system of nerves, here comes into play. The stomach is told that it shall have an increased supply of gastric juice if it will digest more food, and thus the beneficent operation of a stimulus applied to the skin acts in a continual circle for the benefit of all the functions of the body.

MORE EXTENDED BATHING.—The mode of sponging and bathing the surface of the body just described, and which is all that health demands, or the invalid in general can support, does not include the more extended use of the cold bath, in which healthy persons, who are fond of it, are in the habit of indulging. Cold bathing may be used as a luxury just the same as warm bathing; and, to its votaries, it is questionable if the former be not productive of the greater amount of pleasure. But the invalid and convalescent have nothing to do with the use of cold bathing for luxury alone; but occasional or serial cold baths may be taken for the purpose of an increased stimulus, and in the hope of renewed vigour from that increase of excitement.

Cold bathing, however, especially in the open air, can never be safely used by delicate persons until they have habituated themselves to the shock by the regular and systematic use of cold sponging.

The temperature of water in the open air will vary, according to the season, from a degree above freezing point, to 65° or 70°; on the sandy shores of the sea it will rise even higher than this. In this climate, to moderately strong people, water will not be injurious which is not more than five degrees below the temperature of the outer atmosphere, or ten below that of the apartment in which the bath is taken, during the *summer season*. In winter, delicate persons must have

the water raised to 60° or 65°, when it will still be a cold bath. If this be not well borne, raise it to 70°, or even to 75°. But even here, if the bath be properly inaugurated, as above directed, it will generally be possible to lower its temperature, after a short continuance at the higher point, four or five degrees at a time, until it has sunk to the standard used by more robust people.

But the feelings of the individual, at the time he contemplates the bath, must be consulted. It may be that at one time he shrinks from the plunge into water of even moderate temperature, which, at other times, would be delightful to him; and a feeling of languor and chilliness is apt to follow its self-enforced use under such circumstances. In this case, he must be content with simple sponging, or even a tepid bath may be used.

The frequency with which the invalid may use the cold bath will depend very much upon whether it is used for the purpose of hardening an enfeebled frame, or of exciting the functions of the body to more vigorous action. As a luxury, as I have already said, it is unnecessary here to consider it. When so used, the devotee must use his own judgment as to time, place, and manner; always taking care that, by injudicious use, he does not convert his luxury into an injury, and, by excessive indulgence in it, wear out the healthy stimulus which an occasional use *only* seems capable of producing.

When used to harden the frame after illness, for which, however, sponging is generally sufficient, it must be taken as a course two or three times a week; but the immersion should be of short duration—not more than a minute or two—so that reaction may be both rapid and easy. On the other hand, the more legitimate and hygienic use of the cold bath for the purpose of rousing some torpid organ, or the whole sluggish frame, to renewed energy, must be gone about very carefully and systematically.

Here the bath should be used *occasionally* only. It will be found, in general, to produce its best effect when taken at periods varying from once a week from the month of May to October, to once in two or three weeks in the winter.

There is but little doubt in my own mind that the daily or very frequent use of full cold bathing is injurious to persons whose vital powers are not first rate—A 1,—whilst, in the robust, the system may become so habituated to the stimulus, that it entirely loses the advantages which a *fresh* and *novel* agent produces.

But, for the invalid, the power of reaction in the system must be carefully and accurately gauged. This reactionary force will be found correlative with animal heat; those who produce the largest quantity, relative to their weight, of the latter, will be found to react the most vigorously against its abstraction by cold. In practice, this law may be applied by testing the fall of temperature which

takes place in the body whilst in the cold water. Place a small thermometer in the mouth or under the arm-pit, and note the loss of temperature there marked, and compare it with the effect of different degrees of temperature of the bath. The increment of heat in a certain time, which an equal quantity of water in the bath attains, will also be a useful guide. I have found from four to five gallons of water at 55° in a sitz-bath, raised from 2½° to 4° by three minutes' immersion of the hips and sponging of the surface. No feeling of chill was felt afterwards.

Therefore, it has been well observed that 'the conditions necessary to the use of cold bathing as a tonic and stimulant, are that the temperature and the duration of immersion shall be so graduated as to correspond with the reactionary powers of the individual; and never so far exceed them as to pass the bounds of *stimulation*, and so depress them.'

From one to five minutes' complete immersion will be all that health requires; and more than this will oftener prove prejudicial than beneficial, or even harmless.

It will be understood that, although *sea bathing* has not yet been mentioned, cold open-air bathing includes sea bathing, which, unless in exceptional cases, is always the preferable mode of taking it. Some remarks on this point will fall under the head of change of air, &c.

The best time for using cold bathing will de-

pend upon the degree of strength of the patient, and the season of the year. For the vigorous, the first thing on rising in the morning is perhaps the best time, as the skin is then relaxed, and requires bracing, and the system has been refreshed by sleep. But it should never be used by very delicate persons until the system has been fortified by *some* breakfast. It should never be taken within two hours after a full meal, nor when the body is cold, fatigued, or freely perspiring.

Other forms of cold bathing in use at the hydropathic establishments are not entered upon here, because, if they possess any value beyond the sponge and general cold bath, it can only be obtained under the advice of skilled and experienced persons; whilst the unguarded use of them by the public is calculated to produce, and has often produced, most extensive and irremediable mischief. *Valeant quantum*, in the hands of experts.

Section IV.—Sleep.

Little need be said regarding the physiological phenomena of sleep in a work like the present. Its main features are sufficiently well understood, both by the medical profession and by the more educated part of the public, to convince them of the importance of its due amount and proper management to secure the necessary recruiting of the system.

It appears pretty certain that several of the great functions of the body derive the principal part of their renewed vigour during the period of sleep. The muscles are supposed not to be revived at all during waking hours, but only during sleep. The nervous system is also apparently recruited during the inactivity of sleep. It is certain that the thoughts are the clearest and the most easily kept before the attention in the early morning; and this is probably the effect of new nervous matter having been secreted during the night. The mind is always more or less active during waking hours, and then it appears to be all expenditure; no renewal.

The means of attaining sound sleep have been laid down in various works. By the present author they have been detailed at some length in another work, to which he has already referred the reader. All that need be said here as regards the invalid is, that sleep is almost always desirable when it can be obtained; and where the debility is great, there is the greater necessity for sleep. Delicate persons require also the warmth and repose of bed for a larger number of hours than the robust; ten hours not being too many; frequently more. Convalescents from severe disease cannot cultivate sleep too much. It is during the inaction of repose that their reduced frames will be most rapidly rebuilt; and even if sleep be not always attained, rest of body and quietude of mind will be the best substitutes for it.

By day, sleep must be regulated according to the condition, as to debility, &c. Persons of weak digestion generally feel sleepy after a full meal, and it is better to indulge the feeling than, by enforced activity, all against the grain, to disturb the process of digestion. Sleep after dinner should always be taken in the semi-erect position, so as to prevent the contents of the stomach from forcing the diaphragm upwards, and thereby compressing the heart and lungs, and embarrassing their action.

CHAPTER IV.

SITUATION OF DWELLING AS TO SOIL, CLIMATE, ETC., AND HOUSEHOLD CLEANLINESS.

THE notions affixed to the term 'climate' are very variable. Most people think only of the temperature of a place as representing its climate; whilst with others, the degree of rainfall, or the prevailing winds, are taken into the account. Climate, however, in a hygienic sense, is a very compound expression; and should be understood to include the operation of *all* the physical circumstances of heat, light, wind, rain, and other atmospheric phenomena, together with the effects of these upon the soil, and of this latter upon them reciprocally, to which any given locality is exposed.

Thus enlarged, the subject becomes one of such immense extent, and of almost commensurate importance, that it will be impossible to do more in this place than to indicate a few of the leading results of observation as to the effect upon health of the principal modifications of climate to be met with in the temperate zone.

But in order to understand fully the effect of atmospheric variations upon health in a certain district, it will be necessary, first, to make ourselves acquainted with the nature of the soil, the geological formation of the region, and the aspect as regards sun, light, and prevailing winds. These make up the alphabet, as it were, of the climate of one place as differing from that of another in the same region or degree of latitude.

Unless some such comprehensive view of climate as this be taken, there will be no end to the difference of opinion and experience as to the healthiness of various sites, *apparently* similar, and of the disappointment which will attend a hasty and partial judgment in making choice of a place to dwell in. We may fix upon a fine sunny slope on a hill-side, in a beautiful country, sheltered from adverse winds, with the best possible aspect (south-east), thinking that we have secured the perfection of a site; when, lo! we find the house always damp, the surrounding land, as soon as the sun sets, sending up a thick mist, and we shall presently find the pictures on our walls become mouldy, and the paper rotting behind them. On enquiry, we hear that the poor people who reside round about are subject to rheumatism, the women to goitre, and the children to scrofulous swellings. How is this?

We have not chosen a proper geological formation for the site of our house. Instead of building upon the impervious granite or sienite, or trap,

or mountain limestone, we have fixed upon a porous rock—sandstone, chalk, limestone—or a soil underlaid by a hard impervious stratum of dry slate, clay, or marl, and the water which falls upon the hill above us bursts out all along the hill-side in springs, bogs, or spongy earth. The site is, in fact, one of drainage for the ground above. Moreover, to the right and left of our dwelling, be it high or low, bogs on hills, and marshes on plains, may lie between us and the prevailing winds; and fever, ague, malaria, may be ever attacking the inhabitants of the place, and lowering, as they so eminently do, their vital energies. The inhabitants of aguish, marshy districts, seldom enjoy robust health, being subject to a peculiar deterioration of the blood, whence spring dyspepsia, neuralgia, and a host of other less definable miseries.

Section I.—Soil.

It appears, then, that above all other circumstances, the soil should be examined before fixing upon a site (for the invalid especially) to dwell in. Dryness or dampness will be the prevailing character, and of these, one is desirable; the other, if possible, altogether to be avoided. By damp we do not mean humidity of the atmosphere; that may or may not be desirable, according to temperature, and other circumstances connected

with individuals; but *abiding moisture of the ground* is always to be repudiated.

Nor must mere elevation above the surrounding country be taken as exempting any site from the evils of humidity of its soil. Hill-sides especially, if situated as above, are frequently wet—and although you may drain your own plot of ground, moisture percolates down to you from above. This will be the case with soft porous rocks; and with hard ones which contain many crevices, or 'faults.' A knoll, rising from a valley, or situated amongst higher hills, is generally a dry site, particularly if it be composed of gravel. Ravines, the neighbourhood of old water-courses, and narrow valleys or dingles, are bad. The ground at the base of hills is also generally damp, and it will be better to get farther into the open plain. Trees and brushwood make a site damp; their fibrous roots holding the matter entangled amongst them, and their leaves exhaling a very large amount of vapour into the atmosphere.

The immediate soil, that is to say, the loose earth overlying the rocks below, of any situation, should therefore be capable of being well drained; more particularly if the subsoil or substratum of rock be of an impervious character. Most beds of clay are as impenetrable by water as the hardest granite, and the soil above them must, therefore, be thoroughly well drained, and deeply, to prevent water lodging some feet below the surface, by *which* the foundations, cellars, &c. of the house *will be* made damp.

The best soils for building are doubtless the gravelly or sandy; but the latter must be *pure*. In alluvial plains, sand is often mixed with a large quantity of organic matter, and after heavy rains may become decidedly malarious. This is the case with the sandy marshes of the south of France, Italy, &c.

Porous sandstone, if there be not high ground of the same material immediately above the dwelling, is a good rock to build upon; those below you getting the benefit of your sewage. Then come the primitive and metamorphic rocks, granite, trap, gneiss, sienite and the millstone grit, mountain limestone, and old red sandstone. If the water run rapidly off, and none oozes from below, any of these formations, in our latitudes, will be good. Some chalks are very healthy; although the water in these, as well as the limestone districts, is apt to contain a large quantity of lime.

Cultivated land is much more healthy than that which is heathy, woody, or uncultivated. The grass protects the soil from the intense heat of summer, and from too great radiation in winter. It is better to surround a house with green herbage, than with ploughed or dug ground. Newly turned-up land, especially of a sandy nature, with which a good deal of vegetable matter is mingled, has frequently been known to give rise to fevers, and it will be well to bear this in mind when disturbing the soil for a new building.

But it will be necessary to look upon the absorbent properties of the soil with reference to the sun's heat, as well as with regard to moisture. It will be found generally that those soils which are the most loose and absorbent of water, are also those which acquire the highest temperature from the rays of the sun. Thus it appears from the experiment of Schübler, quoted by Dr. Parkes (from whose comprehensive work I derive a considerable portion of these facts relative to soils, &c.), that, taking 100 as the standard, the warmth of soils will stand thus, viz.:—

Sand, with some lime	100·
Pure sand	95· 6
Light clay	76· 9
Gypsum	73· 2
Heavy clay	71·11
Clayey earth	68· 4
Pure clay	66· 7
Fine chalk	61· 8
Humus, or vegetable mould	49· 0

From this Table it will be seen that sandy soils are the hottest, and that the pure clays are amongst the coldest, of the ordinary soils of this country.

Clay retains the water at a few feet from the surface, instead of allowing it to pass through. Hence the heat of the sun, when it does not rain, is continually withdrawing it by evaporation; and hence the fogs, mists, and damp, which characterise such districts, and which are pregnant with catarrh, rheumatism, neuralgia, and scrofula.

If there be any marshy or undrained land

lying at a distance *to windward* of the dwelling, a belt of trees between them will be a protection from the ill effects of the air which has passed over such places, acting as a filter to their exhalation. In planting trees, the prevailing winds should therefore be studied. Trees are too often so placed as merely to keep off some one objectionable wind, as the north, or the north-east; when, possibly, one generally courted will be injurious for that particular site. In cutting down trees, it will be well to take an old piece of advice: look at them for a twelvemonth before applying the axe, remembering the adage, that 'a fool can fell a tree, but a wise man cannot stick it up again.'

Trees should not stand in great numbers too near to a dwelling, especially on the southern side of it. If their shade ever reach the building, it will be sure to make the walls damp in winter, and in that case the nearest trees should be removed.

ASPECT.—The aspect of a house should be as nearly south-east as can be got; after that, any point round towards the west. The kitchen-garden, or any other large surface of dug or ploughed ground, should never lie between the prevailing wind and the dwelling-house, particularly if the soil of the garden be wet, or the ground have been recently turned up.

Section II.—Climate.

These points regarding soil, aspect, and site, form, for all ordinary purposes, the major part of the question of climate, because it is not always possible to choose our dwelling according to latitude or mean temperature, whilst the condition of the soil is both much more under our own control, and presents sufficient varieties within a limited area. But in the case of invalids and convalescents, what is more properly called climate, viz. the heat and humidity of the atmosphere, with the prevailing winds, is of no little importance, both in a preservative and in a curative point of view.

There are certain changes constantly going on in the body, apart from the great processes of nutrition and the other diurnal functions. These changes are performed in cyclical periods; are regular in their occurrence, and periodical in their departure and return. Monthly, yearly, and in a series of years, these changes take place, and usher in those great divisions or stages in life which our great dramatist has embodied in his immortal verse.

In spring, all nature revives and wakens from the insensibility of the winter's sleep. Growth commences, which the summer stimulates and completes. The soft fall of autumn gradually checks the exuberant action, which, as winter again approaches, is once more brought to a stand-still. Cold weather, notwithstanding, has its uses; it hardens and consolidates the new tissue which

has been laid down in the body, and it tends to induce a kind of organic repose which saves the vital powers from exhausting themselves.

For these reasons, the weather of each quarter of the year should be typical—in winter cold, and in summer hot. And as the weather approaches to the condition proper to each season, so, *cæteris paribus*, disease lessens, and the functions of the body receive their healthiest stimulus.

If we apply this to our own country, we shall see the reason why the climate of England is the best climate in the world for Englishmen. It is not that the race has got acclimatised, but that it is born and bred to the climate in which it lives; and bodily habits are most healthily formed under the stimulus of those agents under whose influence they have been, as it were, brought up.

The varieties with regard to climate, in the different parts of our own country, can be compared with sufficient accuracy, because the habits of living are pretty similar in all cases. These differences, now that we have eliminated soil from the question, will be found to reside in the variations of the mean temperature; the variableness of the daily temperature; the degree of humidity; and the prevailing winds.

Of these characters, the two last are of the greatest importance in selecting residence in a country the mean temperature of whose different parts varies so little as it does in Britain.

The question of temperature, therefore, resolves

itself chiefly into one of north and south, and of town and country residence. These circumstances will, in the vast majority of instances, be unalterable by the invalid, except as a matter of temporary change, of which we will speak in the next chapter. It is seldom that he can remove from the bleak Cumberland hills to the soft downs of Sussex or Devon, or leave his town habitation and employment for a wholly rural life.

As regards humidity and temperature, much will depend upon the winds which prevail in any given locality. These, though ever varying, may be reduced to four principal classes, viz.—

1. *The Cold and Moist.*
2. *The Cold and Dry.*
3. *The Warm and Moist.*
4. *The Warm and Dry.*

The two first are emphatically the winds of this country. For eight months out of the twelve, they are the prevailing winds, interrupted now and then, for a day or two, by the two latter. Our island situation, and high latitude, are the cause of the prevalence of these winds; and all we can do in choosing locality is, to select one where their bad qualities will be tempered by other circumstances, or by a considerable infusion of the others, whose breath is more agreeable.

Invalids of any kind, inhabiting a cold wet district, will require extra care in fitting the under-clothing to the exigencies of the climate.

Whatever the amount required to keep the surface warm and moist, *that quantity* must be worn; and if he become oppressed by the weight, he must place some of it to the account of exercise, whose place this action of the skin, in some measure, supplies.

Whenever there is a tendency to scrofula or consumption, or to chronic bronchial, or laryngeal affections; or if atony of the stomach, causing defective digestion, exist, then removal from cold damp situations to warmer and drier will be indicated. Persons whose lungs are affected with any form of disease whatever, or whose bronchial membrane and that of the windpipe and throat are irritable and weak, should always wear a respirator in the open air whenever it is saturated with moisture, and not higher in temperature than 50°. They should take the same precaution in a dry cold wind also, because the moisture passing out of their lungs will be condensed in the meshes of the instrument, and serve to soften the over-dry air inspired.

Frosty air, except when it has followed upon a *dry state* of the atmosphere, is not good for invalids. It is only frozen moisture; the particles of ice often float about in the air, and entering the lungs, irritate and inflame them. This is, I think, the reason why inflammation of the lungs so often supervenes after or during a frost. The soil is the principal element in making a cold wind moist. Whenever the wind passes over a

considerable extent of undrained or thickly-wooded land, it imbibes the moisture continually exhaling from the soil, and carries it to other, perhaps much drier, localities. It is therefore necessary, not only to examine the nature of the soil in the immediate vicinity of your residence, but that of the adjoining land also to a considerable distance, especially on the side whence the prevailing winds blow.

Sea-side residences are not so cold in winter as inland places whose soil is damp, because the sea is a great equaliser of temperature by the air passing over it from cold regions becoming warmed; so that in spring they are preferable to most inland places, if not exposed to the east wind.

Cold Moist Winds.—The effect of cold and humid winds upon the frame is *always* deleterious; much more so when it is rendered weak from constitution, illness, or convalescence. The moist cold reduces the amount of perspiration, and so calls for greater exertion on the part of the lungs and kidneys. Hence it is that exposure to it is so frequently productive of catarrh, bronchial affections, weak digestion, and irritation of the kidneys. Invalids are detrimented to a much greater degree by these winds than the robust, because the strain is laid upon organs, some of which are pretty sure, in their case, to be in a debilitated state, and unable properly to perform their own duty, much less that of the skin in addition to it.

But humidity *within* the dwelling is much more noxious than that without. If the floors or walls of a house be habitually damp, ill-health will be sure to be found within. Rheumatism and bronchial affections are the most common; but neuralgia and stomach affections are also frequent. If the foundations of a house be kept damp by the percolation of water from higher ground above, no number of fires will make that house dry and healthy.

Cold and Dry Winds.—The most frequent form of the *cold and dry* winds are what are generally designated east winds, although they may come from any part of the compass, from north to a point or two south of east. And although they are so well known, and equally well objurgated in this country, the mode by which they cause the discomfort and injury to the system so generally experienced is not generally clearly understood.

It appears that the air acquires pungency as it increases in dryness. The east and north-east winds, coming to us over a vast extent of frozen ocean, or equally extensive regions of frozen soil, are excessively dry as well as cold. In fact, when not very cold, they produce a sensation of coldness by the rapidity with which they absorb the moisture of the skin. So greedy are these winds of moisture, that the skin is robbed of its sensible perspiration with excessive rapidity. It is then excited to increased action to endeavour

to repair the loss; but here it is met by the chill produced by the rapid evaporation of its moisture, and the blood, that would exhale its water at the thousands of minute pores, is forced back again to the interior, leaving the skin dry, cold, shrivelled, and irritated. It is this contrary action which causes the disagreeable feeling, and frequently the highly irritated condition of the skin, in long-continued weather of this class.

Hence the nervous system suffers; the circulation is thrown out of balance, and headaches, irritability of temper, moroseness, even apoplectic seizures, are not an uncommon result.

The most that can be said with regard to easterly winds, in a hygienic point of view, is, that as they are 'neither good for man nor beast,' the best thing is to get out of their way altogether, whenever it be possible. So searching and pervading, however, are these universal tormentors, that it is not easy to do this. A compromise must therefore be made; and whilst exposing himself to their influence as little as may be, the invalid must take what precaution he can against their injurious effects.

The diet, during the prevalence of east, or of any other very *dry* winds, should be regulated with great care. It should be very mild and unstimulating. Farinaceous articles should form a good portion of it, with soups and liquids to replace the fluid which has been withdrawn. Alcoholic drinks do not do well in east winds; but tea

may be taken in greater quantity, both as a soother and as a restorative.

In addition to careful, close clothing, the surface of the body should be frequently bathed with tepid water, and then anointed with a little fine olive oil, or a mixture of oil and glycerine; two of the former to one of the latter.

This anointing is much practised in hot climates, and the negro's skin is always greasy. The effect of dry wind is very similar to that of heat; and the anointing will therefore prove a protection against excoriations and pimples, which are often caused by the too rapid escape of moisture during very dry winds.

Warm Moist Winds.—The warm and moist winds are generally from the south and south-west; in summer from the west also, which, always a moist, is then also a warm one. Active exercise in this kind of weather is generally more or less oppressive, because the air, being already nearly saturated with water, absorbs the perspiration from the skin very slowly, But *passive* exercise may be taken *largely* during these moist winds, because the heat of the body is not rapidly abstracted by them.

The appetite often fails during the prevalence of warm and moist, or 'muggy' weather, in consequence of the diminished tissue change going on in the system. A small increase of stimulants—wine or beer—may be taken to compensate the loss of nourishment; and the exhaustion caused by

exercise in this kind of air must be removed by hot tea and light food.

Warm Dry Winds.—The least common state of the atmosphere, in this country, is that of warmth and dryness. This much-desired combination is therefore sought for at various foreign stations, which have acquired a fame for their general salubrity, or for their agreeability with the tender lungs and other organs of various classes of invalids.

Not that a warm and *perfectly dry* air is either pleasant to the feelings, or salubrious to the constitution, especially of the Anglo-Saxon race. Too dry an atmosphere appears to affect the digestive organs injuriously, making them irritable, and digestion painful; also the skin and nervous system, by continued stimulation. Our cousins in America appear to have undergone a considerable change both in their physical and moral constitution, owing, probably, in great measure, to the more exciting nature of their climate and food.

But, in this climate, the dryest winds of summer contain a good deal of moisture; and it appears from observation that a degree of saturation of the atmosphere ranging from 60° to 80° (complete saturation being taken at 100°) is the most agreeable to the great majority of persons, and perhaps is *necessary* to those who labour under irritation of any of the mucous membranes—of lungs, stomach, intestines—or of the skin. When the

moisture does not exceed 50°, the air is quite stimulating enough to delicate persons, and hence it is that the climate of our own southern coast agrees better with the *majority* of invalids than that of warmer and drier latitudes.

Everything conspires to render a moderately soft, warm air delightful to the feelings, and invigorating to the frame of the invalid; the nervous expansion of the skin is soothed, whilst the circulation in it is gently stimulated. The transpiration through it also is carried off just fast enough to prevent chill being received by that condensation of the sweat which takes place in a cold atmosphere, whilst the vital metamorphosis or destruction of tissue is not stimulated beyond due bounds by a too bracing, or, in more correct phraseology, too stimulating atmosphere.

These winds are not to be enjoyed in our climate, except for a very few days between November and April or May, sometimes not until June. At the sea-side, however, all winds will be moist, and therefore it is that, for many invalids, the coast will prove the best residence from March or April until the beginning of November.

If, during the irritative stage of various diseases — bronchial, pulmonary, stomachic, &c.—a certain large proportion of moisture in the atmosphere is desirable, say from 70° to 80° of saturation, when this stage is passed, and only debility remains, a more bracing atmosphere will be desirable to complete the convalescence. A warm air, toler-

ably dry; an open and somewhat exposed situation, with full exposure to sun, light, and wind, will give us the qualities we want. These are generally to be found in inland places, on dry soils, and amongst geological formations of the primitive series. Malvern, Clifton, some parts of Wales and Cumberland, and places on the eastern sea-coast, as Scarborough and Cromer, will be found suitable for summer and early autumn residence for such persons.

Should the air of these places, however, excite cough, heat and dryness of skin, headache, constipation, or any other indication of over-stimulation, a removal to a moister atmosphere will be at once desirable.

Winter Residence.—We have been presuming that the invalid or convalescent possesses the means and ability to choose, either permanently or temporarily, the most fitting place for recovery from his ailments; and we seem to assume that, for the summer and autumn months, the country or the sea-side is the most suitable to that recovery. But where shall he pass the winter? Where place himself, as much as possible, out of reach of those cold, moisture-laden winds, which prove the pest of our island home, during the winter and early spring months?

Taking all circumstances into consideration, it appears that a residence in a town is generally preferable to one in the country, for the winter *months*. The whole of the soil being covered

with buildings or pavement, there is not so much lodgment of water upon the surface as in country places. If the drainage be good, the rain is carried off directly, and with it the decomposing animal and vegetable matter, the latter of which often poisons the air around the dwellings in rural districts.

The temperature of towns, especially that of the metropolis, is more equable, both from day to day, and by day and night, than it is in the country; that of London being often two or three degrees warmer than that of the surrounding country in winter, as well as in summer.* The peculiarities of the climate of a great city like London are derived from artificial as well as natural circumstances. The heat arising from countless hearths and numerous manufactories increases the winter temperature as well as that of the night; whilst the dense canopy of smoke moderates the fierce rays of the sun, which otherwise, added to the domestic or ground warmth, would cause a considerable elevation of its summer temperature over that of country districts. From these causes the climate is less variable by day and night, from day to day, and from month to month.

Moreover, fierce winds are moderated in large cities by the extent of building, and by the shelter of the streets; whilst they are partially warmed by

* 'The mean annual temperature of London is 50·39, being one and a half degree above that of the environs generally.'—Sir James Clark 'On Climate.'

the canopy of heated air which continually surmounts their local atmosphere.

For these reasons it will appear that persons in weak health will be able to take exercise in large towns more easily than in the country. The pavement presents a drier path, and there is more shelter from cutting winds. But then the paving and the cleansing of the streets must be good, and the latter must be wide enough to admit free currents of air. With these precautions a town residence, properly ventilated, will have the advantage over one in the country from the month of December to that of April, for *most* invalids.

Section III.—House Cleanliness.

All our care in selection of site and adaptation of residence to the peculiar condition of individual cases will be of no avail, and may as well not be taken, if the *internal* condition of the dwelling be unhealthy. A sudden blast of the breath of pestilence, or the poisonous effluvia of masses of putrefying matters, may slay its victims in a few hours, the vital powers being trodden under foot by the march of the plague, just as the stoutest oaks are laid low in a moment before the rush of the tornado. But these are exceptional, and comparatively rare, catastrophes. There are other less striking, because silent and unseen, pests; poisons more diluted, and slower in their operation; unsuspected putrefying matters constantly exhaling

into the air of dwellings—which are only appreciated by their fatal effects. It may be, and to my mind it is certain, that these household miasms cannot, of themselves, beget such specific diseases as small-pox, scarlatina, measles, typhus fever, true Asiatic cholera, nor perhaps any genuine contagious and specific disease. But they can, and *invariably do*, so depress the general tone of the system, and weaken its vital powers, as to render it an easier prey to the special poisons of those diseases whenever they are by any means introduced into such dwellings; whilst the germs of these diseases, some of them at least, actually feed upon the contaminated atmosphere of impure dwellings, and live and multiply thereby.

And not only is this the case, but the general health of the inhabitants of dwellings the air of which is contaminated by any means whatever, is always below par. They are affected by all sorts of anomalous and unaccountable complaints, now of a dyspeptic, now of a neuralgic character; and the doctor reaps a rich harvest in such houses, if the inhabitants be wealthy. Why is this? Because any deleterious influence, acting over a great lengh of time, will have, in the long run, as great an effect upon the constitution as one more violent in its character, but operating only for a short space. The air we habitually breathe, being impure, will infallibly undermine the constitution, because it is every moment being taken into the system and there combined with every particle

of its structure. And if the strong and robust are affected by household uncleanness, how shall the delicate, the invalid, and the young escape? They are every way more susceptible of these influences, because the natural stimuli—the air they breathe, the food they eat, the water they drink, and the temperature they live in—*require to be presented to their inferior organisation in their greatest perfection, in order to counterbalance its inherent or acquired weakness.*

The uncleanness of the air in dwellings arises from one or more of three conditions—Emanations from filth *exterior* to the dwelling, and, entering it, contaminating its air or water; filth *within* the dwelling, and operating in the same way; and insufficient outlet of the emanations from the bodies of the inmates.

Filth without the dwelling possesses so many characters, that nearly the whole of what are called sanitary municipal arrangements are employed upon it. It forms a whole branch of the science of public hygiene in itself, and cannot be discussed here. Moreover, its general features are now so well recognised, that only carelessness or neglect will fail to discover it. Everything which pollutes the air or water of a town or dwelling—sewers, drains, cesspools, collections of animal or vegetable refuse, deleterious exhalations from factories, chemical works, crowded dwellings, stables, cow-houses, *et hoc genus omne*—all contribute to the contamination of the air and drinking water of

any dwelling within the reach (and it is far) of their influence.

The only way for the invalid to avoid the effects of this class of cause is to get away from them so long as they exist; for he can neither live with his windows closed to exclude the air, nor prevent the contaminated water from percolating to the foundations of his house.

With regard to the second means of contaminating the air of dwellings by household impurities, must be understood imperfect water-closets; untrapped, or blocked-up drains; leakage from these, and *regurgitation of offensive smells from the sewers;* collections of dirt in kitchens, cellars, and back yards; unclosed privies and cesspools on the premises; decaying wood in floors and walls; and, generally, any source whatever of decaying organic matter. Any abiding offensive, or even *unusual* smell, should have its source searched out, and the cause promptly removed. No smell but that of clean air should be perceptible in any part of the premises. Our senses, in this respect, will never deceive us, and we should never neglect their warnings.

The emanations of animal matter arising from the bodies of the inhabitants are not so easily distinguished by the sense of smell, because, generally, they are not in a state of putrefaction. When they are so, as those given off by diseased persons, ulcers, wounds, &c., they are the most offensive as well as the most deadly of all household *poisons.*

We know that invalids require *warm* air; but, as I have stated in the second part of this work, that warm air must be pure. If there be sick persons, or habitual invalids, in a house, there is greater necessity than ever for free ventilation, both for the purpose of giving the invalid pure air, and of removing his exhalations, and preventing them from becoming a poison to himself or others.

Any house or room, therefore, which is so situate as not to allow of free ventilation without admitting bad air or foul odours from the surrounding neighbourhood, is not a fit residence for persons in delicate health, and should as quickly as possible be abandoned.

CHAPTER V.

CHANGE OF CLIMATE, SCENE, AND OCCUPATION.

It would be beyond the scope of this little work to enter upon the wide field of change of air and climate, with respect to its effects, either as a preventative or as a remedy for disease. Such a subject ought not to be entered upon unless with space at command commensurate with its importance. All that will be attempted here, therefore, will be to lay down a few general principles as a guide to the invalid in seeking to relieve his sufferings, or improve his health, by change either of residence, scene, or occupation.

The remarkable effects derived from change of almost any kind, in certain conditions of the system, must have fallen under the observation of the most cursory observer. So palpable is this, that it has almost passed into a proverb that 'any change is better than none at all.' Invalids have asserted that even a change from a good air to one considered to be much inferior has resulted in vast benefit. No wonder then that a removal from an unhealthy or disagreeable climate to a

more genial and salubrious one is too often expected to work a miracle upon the constitution of the sanguine invalid.

In endeavouring to trace the rationale of the operation of 'change,' we shall require to take into account other influences than those which arise from the mere variation in climate, soil, temperature, &c.

Has it ever been taken into account, in estimating the value of change in modifying the constitution of our race, the effects of change, whether of climate, soil, or locality, upon the members of the vegetable and animal kingdoms? In a wild or natural state, all these are allowed to thrive best in their natural *habitat*—in the climate and soil in which nature has planted them; and the effect of removing them to one to which they are strangers is often to cause a profound modification in their habits, and even their structure—not necessarily for the better, often for the worse.

But with animals, and even plants, in a state of *domestication*, in which they can more properly be compared with man, the effect of change is different. Here, change of soil, of locality—that is, of climate within narrow limits—often produces the most beneficial effects. The agriculturist finds that, if he wishes to secure the finest and most plentiful crops, he must change the seed from which he raises them—not the nature of the seed, but the place and soil on which it has been

raised. So also with his flocks and herds. He finds that crossing with others of the *same* breed, raised at a distance from his own, which is the same thing as the change of seed in the plant, produces good results. Greater fertility, finer fleeces, superior meat. It is not here a question of crossing different *breeds* or *varieties*; that would be analogous to the intermixture of the different races and nations of men—quite a different thing.

And the same good effect is undoubtedly observed from pursuing the same course as regards the human race. Those people who live in secluded localities, as the narrow valleys of Switzerland, the remote districts of the south of France, or even of our own country, are generally inferior, both in physical and mental development, to the inhabitants of places where intercourse and commixture of different families is more complete. The principle is seen in operation even amongst different *classes* of society; the breeding in and in of a class being second only to that of relations or families in its contracting effects upon the mind, and its debilitating operations upon the bodily organs. The degeneracy of the old Spanish nobility, the result of a proud and arrogant exclusivism in marriage, is an instance in point at one end of the social ladder; and the equal degeneracy of some almost savage tribes of Irish in the wilds of Connemara, points the same moral at the other end of it.

These facts have reference to the *physical* effects produced by change of *physical* circumstances; the mind is not here brought into operation. They are probably owing to the operation of the vital stimuli of air, climate, food, &c., in different ratios or degrees, producing, if long continued, a considerable change in the constitution and temperament of those who undergo them.

This is the kind of modification which we seek to obtain when a complete change of climate is resolved upon. We desire either to prevent the development of the seeds and germs of disease into activity, or else to ward off the ill effects of present circumstances upon established mischief.

But to obtain all the advantages of change, either of climate or of residence, it will not only be necessary to make ourselves acquainted with the nature of that to which we contemplate removing, but we must take into account the effects of the loss of those comforts and appliances which we leave behind. Thus, in seeking the softer and milder air of an Italian sky for a consumptive patient, we must take into the account, *per contra*, the effects of the journey, the loss of English comforts, the absence of kind and sympathising friends, and most of the other *adjuvantia* which alleviate the distress of the sick couch, and smooth the road to the inevitable end. No small drawbacks, these, to be placed against the soft influences of a milder clime.

Then again, we here in England are accustomed to a very variable climate, but one varying within a very limited range; limited in its diurnal, seasonal, and annual range. We grumble at the English climate because we never can tell from day to day, scarcely from hour to hour, what the weather will be; yet these perpetual changes it is which excite the functions, whilst they put our ingenuity to the test to provide against them. Most foreign climates to which our countrymen resort, differ from our own in this respect more than in any other. The weather is more steady from day to day, but the changes, when they do occur, are more sudden, more violent, and less easy to be guarded against.

All writers on climate have found themselves obliged to take this peculiarity of the climate of the British Isles into consideration when descanting upon the advantages of others. Sir Humphrey Davy remarked upon the suitability of the English climate to the English mind; doubtless because the one has, in great measure, grown out of the other.

'Of all the climates of Europe,' says Sir Humphrey, 'England seems to me most fitted for the activity of the mind, and the least suited to repose. The alternations of a climate so various and rapid continually awake new sensations; and the changes in the sky from dryness to moisture, from the blue ethereal to clouds and fogs, seem to keep the nervous system in a constant state of

excitement.'* Dr. James Johnson, in his delightful and instructive work on 'Change of Air,' also lauds the climate of England as compared with that of Italy, upon much the same grounds.

It behoves us, then, in seeking change of climate, to note what *kind* of change is indicated; and whether other circumstances, which may be inseparable from the quality we want, will, or will not, interfere with its beneficial operations. Here, it is the length of our winters, and the long duration of moist but not very cold weather which accompanies them, which make most against the invalid and convalescent.

On this account it will often be desirable for the convalescent from debilitating disease, especially if the lungs, skin, or kidneys have been implicated, to pass the winter in the south of France, or at Nice, Mentone, Pisa, or Madeira, in order to protect his weakened frame from the depression of the long winter of this climate. But our own country affords many spots where an almost Italian climate may be obtained for at least the early part of the winter, and a residence in London or other large town may do for the spring months.

The climate of Italy, as well as that of our own southern coast, the Isle of Wight, &c., is well adapted for that repose of the system which is required after exhausting diseases. A great mistake is often made by going to places whose

* 'Consolations of Travel.' 1830.

climate is very dry and bracing, in the belief that the system requires this stimulant treatment. Far from this being the case, what is generally required, for the earlier stages of convalescence at all events, is a soft and still air, conducive to inaction and repose. Here the debilitated powers will be out of the reach of undue excitement, and be allowed to proceed in that gradual reintegration of the system which must precede active exercise and stimulation. This stage over, the invalid may then very properly remove to a drier and keener air, such as from Torquay, Sidmouth, Hastings, or Ventnor, to Ramsgate, Scarborough, or Aberystwith, on the coast, or Malvern, Leamington, or Tunbridge Wells inland.

These observations apply more particularly to those affections of the young where there is a suspicion of scrofulous or consumptive taint, or where the digestive functions have been much injured by excess, anxiety, or overwork.

On the other hand, the debility resulting from fevers, eruptive diseases, indigestion, and nervous affections will be best removed by passing to a dry, warm, and therefore stimulating atmosphere, at once. And if it be dry and clear, a rather cold climate will not be objectionable, especially in summer. A ramble on the Scotch or Welsh mountains will here be preferable to any sea-side place, and travel from place to place better than a fixed residence.

Persons convalescing from serious disease often

make a great mistake in seeking change of air at too early a period. They are tired of the ennui and confinement of the sick room, and think that they cannot too soon get away to the place recommended for perfecting their recovery. This haste frequently defeats its own object. The fatigue of the journey, and other taxes upon the patient's strength, often throw him back a week or two, or even longer. So long as the frame is greatly debilitated, it will acquire strength much faster in the quiet of the patient's own home than amid the bustle and excitement of a removal, by which the expenditure of strength often exceeds the gain. Whilst the body and the mind remain in perfect rest and inaction, it is all gain and no loss; and the accumulation of vital force goes on without a drawback. As soon as moderate exercise is found only to increase appetite, without causing much fatigue, we may safely direct our patient to proceed to change of air in order still further to hasten the convalescence.

Another error usually committed by persons engaged in important affairs is to endeavour to unite business with convalescence; running down to the sea-side only for a day or two in the week, and working at the desk or counting-house during the remainder. Like all other half measures, this is a very ineffective proceeding. A fortnight's complete rest will do more than a whole season of this half-and-half course.

The habits of the invalid and convalescent as

regards meals, exercise, &c., frequently undergo a great change along with the change of air; sometimes too great a change. Either he is induced to eat too much, or too often, or he is tempted to try things which are beyond his powers, just because he hears of his friends doing so. He should remember that no two cases are alike; and that, as a rule, that regimen is the most proper for him, with slight alterations, which has been laid down for his use during convalescence at home.

Change of scene differs in many respects from change of air; although, of course, it is included in it. Here, we expect to affect the bodily functions through the medium of the mind; and in doing so we bring to bear upon them an influence not very well defined or understood, perhaps, but one the great powers of which no one can doubt.

In point of fact, a very great portion of the good derived from what is called 'change of air' does not enter the system by the medium of the lungs at all. It is the senses, the feelings, the emotions, which are acted upon by the new circumstances in which the invalid is placed. It is the novelty, the thorough change of action, the relaxation of the over-strained faculties, the rest of the wearied limbs, which makes cheerfulness take the place of torpor and ennui, and hope that of brooding melancholy and despair.

'There is a condition or state of body and

mind,' said Dr. James Johnson, in his eloquent exordium to the amusing work above alluded to, 'intermediate between that of sickness and health, but much nearer the former than the latter, to which I am unable to give a satisfactory name. It is daily and hourly felt by tens of thousands in this metropolis, and throughout the empire; but I do not know that it has ever been described. It is not curable by physic, though I apprehend that it makes much work for the doctors ultimately, if not for the undertakers. It is that *wear* and *tear* of the living machine, mental and corporeal, which results from over-strenuous labour or exertion of the intellectual faculties, rather than of the corporeal powers, conducted in anxiety of mind and in bad air. It bears some analogy to the state of a ship, which, though still seaworthy, exhibits the effects of a tempestuous voyage, and indicates the propriety of recaulking the seams, and overhauling the rigging.'* The excessive tension at which the mental faculties are kept for ten or eleven months of the year, in the vortex of London life, by the never-ending competition and struggle for mastery and pre-eminence to which all classes who live by the exercise of their intellect are subjected, produces this incessant *wear and tear* of body and mind, the result and acme of which is premature old age. You may read it in the 'careworn countenance,'

* 'Change of Air,' p. 3. 1831.

in the hair prematurely grey, in the lank and stooping frame, in the chronic dyspepsia, the languor and feebleness of the muscular system, and, ultimately, in the feeble and worn-out heart.

Thus, hurry and worry—the characteristics of the age in which we live—keep up a perpetual excitement of the nervous system, an hyperæmic condition of the brain and nervous centres, which become chronic; and hence the other organs suffer from the withdrawal of the due amount of nerve-force which, in a state of health, is always being sent to them. It must be clear to anyone that neither diet, exercise, bathing, nor any other hygienic measure, will be of any avail towards the removal of this condition, so long as the ever-acting cause remains in operation. But doctors will be fee'd, quacks will fatten, and nostrums of all kinds will be swallowed, until the public take the trouble to make themselves acquainted with those fundamental laws which rule over the functions, corporeal and mental, of their frames, and are convinced that those laws cannot be habitually broken and set at naught without a Nemesis—a demon of bodily pain and mental exhaustion and ennui, which will render the remainder of their lives a misery and burden to them.

But a compromise is now attempted. 'Carry me on through incessant worry and anxiety,' may the man of business be supposed to say to his brain, 'for eleven months of the year; go on until you are fairly worn out, and on the point

of breaking down finally, and *then* I will really give you a whole month of idleness. You shall not be called upon to do anything at all during the delightful trip we will take abroad; or, if you like, we will go to the sea-side, and there you shall go to sleep until the day when we return to town and to work, and, then I shall expect you to be as brisk as ever again.'

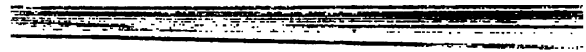
And so perhaps it is for a time. Every returning year, however, finds the nervous system returning to its labour with less fully recruited powers; whilst the strain upon it, as exertion ripens into success, and the desire for distinction changes into a mere craving for wealth, is rather increased than diminished.

And so it comes to pass that the valetudinarian, ever seeking in change of *place* that which he might more certainly find in change of *habit*, tires of those places to which he has been wont to resort, believing that they have lost their efficacy. 'Fresh fields and pastures new' must be sought for, until the whole of this continent, and often a good part of another, have been ransacked for their imagined health-giving virtues. 'If half the diseases,' says Dr. Johnson, 'which are said to be cured by Cheltenham, Bath, Harrogate, and other places, were really arrested in their course, we cannot help wondering that anyone should be suffered to die in these islands.'

It is, then, in change of *habit*, in relaxation of *mind*, and in well-directed amusement, that we

should seek to alleviate the effects of the bodily and mental wear and tear above alluded to. Convalescents, as well as habitual invalids, must mix a good deal of amusement, not necessarily of a trivial nature, with their sterner duties and studies. The mind in sickness, and for some time after it, is often as weak as the body, and unable to pursue its usual processes of judgment and reasoning. We must, therefore, fall back upon mere *recipiency*—the exercise of the perceptive faculties; and thus it is that watering-places, which present a number of objects and scenes of an amusing character, have acquired a fame for cures which have had no real reference to the mere locality.

But sight-seeing, to be agreeable and useful, must not be overdone. The senses soon become fatigued, and the mind partakes of their lassitude. Gentle and continual change, such as can be secured by judicious, quiet, and well-chosen travel, presents the greatest promise of relief from the effects of the overstrain of the bodily and mental powers above described; whilst a more Christian-like admixture of lofty aspirations after future good with the too-absorbing 'thought we take for the morrow,' would go a great way towards its prevention.



APPENDIX.

DIET FOR THE SICK, INVALID, AND CONVALESCENT.

THE FOLLOWING TABLE is intended to exhibit the principle upon which it is believed diet should be regulated for the sick and invalid, according to the best known physiological principles. It will be observed that the articles derived from the vegetable kingdom are placed in juxtaposition with those from the animal, so that a choice may be made of several dishes derived from either one of them, or of some of each; a dietetic relation being observed in the properties of those placed in each class.

At the commencement of acute disease, whilst the vital powers are still good, and disintegration of the fabric of the body is going on in preference to repair, physiology and the natural instincts of the sick point to a diet composed chiefly of farinaceous substances, which are serviceable in preserving the temperature of the body without calling for the exercise of much stomachic digestion. With these, if animal food be given at all, it should be of the lightest description, and that nearest resembling the rest of the diet.

On the contrary, towards the termination of acute disease, when the vital powers flag, or after long and exhausting illness, the appetite having returned, the opposite proceeding will result from the principle just stated. Animal substances chiefly, along with the stronger portion of those vegetable matters which, from the large proportion of albumen they contain, approach nearest to animal food in composition, must now form the main elements of the diet.

TABLE OF DIETS.

1. LOW DIET, IN FEVERS, INFLAMMATION, ETC.

FARINACEOUS SUBSTANCES.	Per cent. of starch.	ANIMAL SUBSTANCES.
Arrowroot	86	Whey. Buttermilk.
Tapioca	84	Milk. Skim-milk.
Sago	83	Eggs.

2. FISH DIET.

Vermicelli		Trout. Sole, and other *white* fish.
Macaroni		
Rice flour, Rice	70	Oysters.
Cocoa		Milk with suet.
Chocolate		Barley broth. Tripe.

3. MEDIUM DIET, IN CONVALESCENCE.

Pearl barley	74	Mutton broth. Beef tea.
Biscuit flour	70	Veal broth. Jelly, calves' feet.
American corn-flour	68	Chicken. Turkey. Lamb. Game.

4. STRONG DIET, IN GREAT EXHAUSTION, WITH APPETITE.

Wheat flour	70	Neck of mutton.
Bread	44	Kidney. Sweetbread.
Oatmeal	62	Venison. Game. Beef (stewed).

FRUITS.	VEGETABLES.
1. Oranges. Roast apples.	1. Brocoli and Cauliflower.
2. Strawberries. Currants.	2. French Artichokes.
3. Grapes.	3. Carrots and Turnips (young).
4. Ripe pears.	4. Very mealy potatoes.
	5. Young soft peas.

A. DRINKS FOR THE SICK.

Pure cold water is the best of all.

1. WHEY.

Pour a pint of good new milk into a saucepan over a slow fire. As soon as it boils, pour in slowly a wine-glassful of white wine—pale sherry, bucellas, or marsala—or, if wine cannot be obtained, a small lump of alum. Boil gently, and the curd will separate in masses from the whey, which is then to be poured off into a basin, and taken hot. Toasted bread may be added. A little sugar and a bit of lemon peel will give it flavour. Very useful as a drink in fevers and feverish colds, to promote perspiration.

2. RICE WATER.

Wash an ounce of the best rice well in cold water. Then put it into a pint of cold water, and let it stand near the fire for three or four hours; strain and set to cool. Add a bit of lemon peel and sugar if required. A cooling drink in fevers and inflammations.

3. BARLEY WATER.

Barley water may be made in two ways—thin or thick. When required only as a diluent it should be thin; if food be the object, it must be thicker.

Thin Barley Water for Drink.

Wash some pearl barley very clean in two or three waters, cold. To an ounce of the barley add a quart of boiling water, and let it stand covered near the fire for two hours. It must not be boiled. Add two or three slices of lemon, some of the peel, and sweeten to taste. In irritation of the stomach, intestines, kidneys, or bladder, this is, *next to cold water*, the best diluent we have.

Thick Barley Water.

After cleansing the barley as above, take one ounce or more of barley to each pint of water; let them simmer

together for two hours, adding a few raisins, opened, a little lemon peel and sugar, during the last quarter of an hour. It need not be strained. When this can be taken freely, it affords a considerable amount of nourishment. Useful in great prostration, and in debility of the digestive organs.

4. TILULE.

Tilule is an agreeable drink, much used on the Continent, especially in France and Germany. It is made by pouring cold water upon the dried flowers of the lime or linden tree. If carefully dried in spring, the flowers may be kept through the whole year. It is slightly stimulant and diaphoretic.

Apple, currant, and raspberry water, all agreeable drinks, but inferior to plain spring water in slaking the thirst in fevers, &c., are made by pouring hot water upon some of the pulp of the ripe fruit, straining, and sweetening to taste.

5. LEMONADE.

Remove the outer peel of one or more lemons, according to their size; slice them, and put them with the peel into a small quantity of boiling water, and cover up close. Melt some white sugar in another portion of boiling water, and add to the above. Stir them well together; then add cold water gradually until the mixture comes to the desired taste; then strain. Oranges and limes may be used, either alone, or mixed with the lemons.

A cheap kind of lemonade for the poor may be made by putting half-an-ounce of cream of tartar, or a dram of tartaric acid, with a little lemon peel, or a few drops of essence of lemon, into a jug, and adding to it two or three pints of boiling water. Sweeten to taste.

6. TAMARIND WATER.

Into three pints of water put an ounce and a half of best tamarinds, two ounces each of currants and raisins, washed and stoned; boil until it is reduced one-half, then add a

bit of lemon peel, and strain. Agreeable when acid and strong-flavoured drinks are desired.

B. GRUELS, &c.

1. OATMEAL GRUEL,

although a popular favourite in the sick room, is seldom well made. Use one ounce of fine meal, or prepared groats, to a pint of water. Mix the meal with a few table-spoonsful of cold water slowly in a basin, until perfectly smooth; let it stand to settle, then pour off the upper and thin portion only into the rest of the water boiling in a saucepan, stirring all the while. Boil slowly for ten minutes. A little milk should always be added to gruel whilst boiling.

Gruel may be eaten with salt and a little butter, when stimulants are interdicted. At other times, some wine and sugar may be added.

2. ARROWROOT.

This should always be made thin, and should always contain *some* milk, otherwise it affords no nourishment. Use half an ounce (a large table-spoonful) to a pint of milk, or milk and water. Mix the arrowroot well with a spoonful or two of cold water, and add boiling milk to it, stirring well all the time. Arrowroot should not be boiled. Ground rice, with milk, may be used in the same way.

3. SAGO, TAPIOCA, AND AMERICAN CORN-FLOUR.

Wash the grains of sago and tapioca well in cold water, and pour the water away. Then let them soak in fresh cold water for two or three hours. They are then to be simmered in milk, or equal parts of milk and water, until the grains look transparent and like jelly. Use half an ounce to a pint of milk. If made with water only, sago and tapioca, like arrowroot, afford scarcely any real nourishment, but are useful as a vehicle for wine.

C. BROTHS AND SOUPS.

1. BEEF TEA—LIEBIG'S RECEIPT.

Mince very small a pound of good juicy lean beef. Pour upon it one pint of cold water. Place in an oven or by the fire, covered, for three or four hours. It must not be boiled, and the heat should not exceed 150°. Add salt and pepper to the taste.

Weak beef tea may be made with cold water. Infuse the minced beef in cold water for six or eight hours; then press the juice out of the meat. Heat the liquor when wanted, and add salt and pepper.

2. MUTTON BROTH.

It should be made with the lean part of a neck of mutton, one pound to two pints of water, boiled down to one pint. A few vegetables, some parsley, and a little well-boiled rice or barley should be added. Remove the fat. It will not keep, and therefore must be made fresh every time.

A weaker broth than beef tea.

3. CHICKEN AND VEAL BROTH.

These are esteemed lighter and less stimulating than beef tea. They contain a good deal of gelatine, which here replaces the albumen of the beef.

Take a knuckle of veal, a cow-heel or two, or the legs and wings of fowls, and divide into pieces the size of walnuts. Boil slowly for two hours. Flavour with parsley, leeks, or onions, to taste. Add pepper and salt.

4. STRONG BROTHS, FOR CONVALESCENTS.

These may be made by mixing together several kinds of meat, such as beef, mutton, and veal, with a knuckle

of ham, cow-heel, &c. Bones may be added, and any leavings of meat which are not too stale. Allow a pound of meat to a pint of water. Stew some slices of onion, peppercorns, and salt, in a little hot water; pour it over the meat, and cover close. Keep the mass from burning until it is nicely browned; then add the remainder of the water cold, and simmer, closely covered, for three or four hours. If there is much fat, skim it off when cold, and warm the liquor again. It must not be boiled fast. A strong broth when the appetite is good.

5. GILLON'S ESSENCE OF MEAT.

This invaluable fluid is now readily obtainable in every town; and as it keeps for any length of time, and in all climates, its use cannot be too extensively advocated by medical practitioners. It is made by subjecting raw beef, mutton, veal, chicken, or other animal flesh, to hydraulic pressure until all its juices and salts are extracted. It has the taste of the fresh gravy of the meat, and is perfectly clear and free from impurities.

Mix one part of the essence with one or two parts of hot water, according to the strength required. Add salt and pepper, or cayenne. In cases of great prostration, the pure essence may continually be given in tea or dessert-spoonsful. I have never known it disagree, although a few persons have not liked its flavour. After the tin has been opened it must be kept strictly closed to exclude the air.

D. JELLIES, PUDDINGS, &c.

1. ORANGE AND OTHER JELLIES, WITHOUT WINE.

Take one ounce of gelatine or isinglass, and melt it in a small quantity of hot water. Squeeze the juice out of six oranges (or of two lemons), or oranges and lemons mixed; put in some of the outer rind pared thin, and a quarter of a pound of lump sugar. After melting the sugar in some hot water, pour on the juice, then boil the whole for two

or three minutes, and strain. Wine or brandy may be added when required.

2. ARROWROOT JELLY.

Put into a saucepan half a pint of water, one glass of sherry, a little nutmeg and sugar. Give them a boil up, then mix slowly a dessert-spoonful of arrowroot with cold water; return the whole into the saucepan and boil for three minutes.

3. CALVES' FEET IN MILK.

Boil two calves' feet in two pints of water and milk for three hours and a half.

4. MILK PORRIDGE: ENGLISH.

Rub up a table-spoonful of good flour, or fine oatmeal, in a little cold water, and when well mixed pour it slowly into a pint of hot milk and boil for a few minutes, stirring it well.

5. BOILED RICE.

The great fault is in not boiling it enough. If the starch cells are not burst, no nourishment will be derived from the rice. Wash the rice well with cold water. Then steep it in hot water, not boiling, for two hours, or until the grains are well swollen, and boil for twenty minutes. Drain through a sieve, and set it before the fire to dry and swell. It may be eaten plain, or added to boiled milk, forming rice-milk—the *riz-au-lait* of the French.

6. MACARONI AND VERMICELLI.

Add a little cold water to one ounce of either of the above. Boil for a few minutes, then pour away this water, and boil in half a pint of milk; or they may be made into puddings and baked.

Macaroni is a very cheap and valuable article of sick-room diet. It and vermicelli may be advantageously

added to any kind of broth, or eaten with a chicken or a chop, in place of vegetables. It is a perfectly safe food in all stages of illness.

7. SUET BOILED IN RICE-MILK.

When the milk is nearly boiled enough, take a dessert-spoonful of beef suet, already shreaded and minced as small as bread crumbs, and add to the milk. Boil slowly for a few minutes, and take off the scum as it rises. Or the suet may be enclosed in a muslin bag. It must be eaten hot.

This was once a favourite remedy for consumption. It is certainly one of the best means of getting fat taken into the system when there is a demand for that element, as where cod-liver oil is indicated.

8. BATTER PUDDING.

Take one egg; suet, half an ounce; flour, four ounces; milk, three-quarters of a pint. Bake or boil. The gravy of roast meat poured over this makes a rich and agreeable dish.

9. RICE PUDDING.

Three ounces of rice, one of sugar, two eggs, half an ounce of butter, one pint of milk. Bake. This is a perfectly normal food. (Dr. Dobell.)

10. BREAD PUDDING.

Grate a few ounces of stale bread into crumbs. Pour boiling milk over them, and cover close from the air. When the mass is quite smooth and cold, add sugar, and an egg or two, a bit of nutmeg, and a few drops of essence of lemon, and bake or boil.

11. APPLE, OR OTHER FRUIT, WITH BREAD CRUMBS.

Boil the fruit well; then rub the pulp through a hair sieve. Make it thick enough to stand in a conical shape; add

a little butter; then surround the mass with a coating of crumbs of stale bread, browned before the fire. A nice relish, and generally a safe one. Useful where fruit is allowed, but not paste.

12. TO BOIL TRIPE.

This excellent food is not appreciated, at least by the wealthier classes, as it deserves to be. It is the most easily digestible of all meats; indeed it comes nearest to the pudding tribe.

See that the tripe has been well cleaned. Boil it in water till quite soft, then pour off the water and boil for a few minutes in milk, adding a little onion sauce. Serve in a tureen.

HOUSE, OR MEDIUM DIET, OF VARIOUS HOSPITALS.

The following list has been chosen out of a large number of Hospital Diets, as presenting what is considered, from a fair selection, to be a proper medium diet for convalescents. From this table individuals may judge if their diet be in excess or deficiency:—

DAILY HOUSE DIET.	Meat	Bread	Potatoes	Milk	Beer
	oz.	oz.	oz.		
Hanwell Lunatic Asylum .	3	14	8	3 oz.	1 pint
Middlesex Hospital . .	4	12	8	½ pint	—
Bartholomew's Hospital .	4	12	8	½ „	1 pint
Consumption Hospital .	4	12	8	½ „	—
St. George's Hospital . .	6	12	8	½ „	1 pint
Westminster Hospital . .	8	14	12	½ „	—
Woolwich Military Hospital	5½	12	16	½ „	—
Royal Sea Bathing Infirmary, Margate .	6¾	17	8	½ „	2 pints
Worcester Infirmary . .	3	14	8	with tea	1 pint

Tea and butter, or soup, are given in addition; and eggs are largely used as extras.

Youths over 13 are considered as adults. Children have as much as they can eat.

CLYSTERS, ENEMAS, LAVEMENTS.

1. APERIENT.

1. *Powerfully aperient.*—One ounce of Epsom salts, or a table-spoonful of common salt, dissolved in two or three pints of thin gruel, strained.

2. *Moderately aperient.*—From one to three ounces of castor oil, or a table-spoonful of sweet olive oil, well mixed with two pints of gruel.

3. *Simply to relieve the lower bowel.*—Make a lather of any mild soap in a pint or a pint and a half of warm water, and inject.

All these should be injected slowly by means of a patent enema syringe, with piston, and not from an elastic bottle. Pass the pipe, well oiled and warmed, into the rectum, also oiled, as far as it will go, and work the piston firmly but slowly, stopping every time the patient feels disposed to empty the bowels. By proceeding slowly, a much larger quantity will be received than when the injection is hastily performed.

2. INJECTIONS OF WARM WATER.

One to two pints are serviceable in allaying pain in the lower bowel, bearing down and spasm about the rectum, bladder, or genital organs, and to induce the menstrual flow.

INJECTIONS OF COLD WATER,

half a pint to a pint, are an excellent means of overcoming habitual constipation, piles, prolapse of the bowel, and the irritation caused by worms in the rectum. In this last case, a dessert-spoonful of salt may be added with advantage.

In giving an enema to a child under ten years, from six to eight ounces of fluid will be sufficient. For a baby, three or four ounces. An elastic bottle, fitted with a very smooth pipe, is the proper instrument to be used for young children. Castor oil is the best aperient to mix with the starch or gruel.

3. ANODYNE CLYSTER.

To allay severe pain of the bowels, rectum, bladder, or womb, there is nothing more serviceable than an anodyne enema. For an adult, two grains of the watery extract of opium may be rubbed up with two ounces of starch and injected into the rectum by means of a syringe. Oil the point of the instrument well, and take care not to use violence. Effort should be made to retain the fluid in the bowel as long as possible. If this be difficult, from 25 to 30 drops of *Battley's solution of opium* mixed with one table-spoonful of thin starch will be sure to stay. When it is desirable to administer anodyne clysters to young people, be careful not to give too much. One drop of laudanum for every year of life, with a little starch, will be a proper quantity.

4. STARCH ENEMA, FOR DIARRHŒA AND DYSENTERY.

Make a pint of thin smooth starch; mix carefully with it from ten to twenty drops, for an adult, of laudanum, and inject slowly. In some cases, larger quantities of starch will be serviceable. For children, use only one drop of laudanum for each year of their age.

5. ENEMA FOR ASCARIDES, OR THREAD WORMS.

Infuse a drachm of quassia chips in half a pint of hot water. Let it stand for two hours; strain, and add two tea-spoonsful of salt. Use cold as an injection the first thing in the morning for several days in succession. An aperient of three grains of calomel, with from five to ten grains of jalap (according to age), should be given once or twice to expel the dead parasites.

6. ENEMA FOR HYSTERIA.

Make an injection of a pint of thin gruel. Add half an ounce of tincture of assafœtida, or, if the stench be objected

to, one table-spoonful of spirits of turpentine with twenty drops of laudanum, and inject slowly into the rectum, the bed-pan being at hand.

BATHS.

1. A SALT WATER BATH

may be made by adding a pound of common salt (there is no additional efficacy in rock salt), to every four gallons of water. Crystallised sea salt is now sold in little bags for the purpose of more closely imitating the sea water.

2. ACID BATHS

for the feet, and for sponging the surface of the body when it is desirable to excite the skin powerfully, as in jaundice, and chronic diseases of the liver.

Take three ounces of hydrochloric (muriatic) acid, two ounces of nitric acid, of water five ounces; mix. Add three ounces of this mixture to each gallon of water. Two gallons will suffice for a foot or sponging bath. Make the whole of a comfortable warmth by heating a portion of the water. Place both feet and legs in the water, and sponge the legs, thighs, inside of the arms, and over the region of the liver. This should be practised for ten or fifteen minutes, morning and evening. An earthenware foot-bath must be used, as the acid will corrode those of metal. (Sir Ranald Martin.)

For a full-length bath immersion, pour three ounces of the mixed acids into eight gallons of water.

3. SULPHUR BATH.

Dissolve half a pound of the sulphuret of potash in the water, and apply to the whole surface in a slipper-bath. This need not be changed oftener than after three or four times using. Place in an out-house where the stench will not ascend into the house. Dissolve the salt in a quart of

hot water in the first instance, and add to the remainder. Useful in certain scaly eruptions of the skin—itch, lepra, &c.

4. HOT-AIR AND VAPOUR BATHS.

Many medicinal substances may be exhaled and applied to the skin by means of hot air, or the vapour of water. They should always be used, however, under the direction of the medical adviser. But simple hot air, or water vaporised, is a ready and certain means of procuring perspiration and relaxation of the skin, and may be used with safety in the following manner:—

Place the patient, divested of all clothing, in a cane-bottomed chair. Place a spirit-lamp alight on the floor beneath the chair, and surround all with a blanket, fastened close round the patient's neck. Or an ounce or two of spirits of wine may be poured into a saucer, and placed on the floor, and then lighted, whilst the patient sits or stands over it. The blanket must be spread out widely at the bottom, and kept so by books or weights placed upon it. This hot-air bath may be converted into a vapour-bath by pouring some hot water into a rim placed around the spirit-lamp, or into a saucer over the burning spirit. Boiling water poured into a foot-pail, the patient sitting on a chair over it, and the whole surrounded with a blanket, will make a tolerable vapour-bath.

These baths may be used whilst the patient lies in bed; the hot-air or hot steam being conducted, by means of a piece of gas-piping into the bed (at a distance from the person). It will be necessary to raise the bedclothes into a kind of tent by means of props. For hot air place a spirit-lamp under the piping before it enters the bed. Steam may be got from the spout of a tea-kettle kept boiling on the fire; or a foot-pail of hot water may be placed in the bed, the clothing being elevated as before.

FOMENTATIONS AND POULTICES.

Flannels, wrung out of hot water, are the simplest mode of fomentation. They are very soothing in pain in the

stomach, bowels, or loins. They may be replaced by bran poultices, when the continued changing of the flannels would fatigue the patient. A bran poultice is made by scalding some bran in a soup plate, and putting it into a flannel bag, which is laid flat upon the seat of pain. A table-spoonful of spirits of turpentine sprinkled upon flannel wrung out of hot water, and applied to the skin, is a good and rapid counter-irritant. The warm water has the effect of making the burning more endurable. Spirits of ammonia may be sprinkled upon flannel wrapped round a half-pint bottle filled with hot water, and applied to any small spot requiring counter-irritation.

LINSEED MEAL POULTICES

are superior to fomentations when they are to be applied to the chest. From half a pound to a pound of linseed meal will be required to envelope one side of the chest. Keep warm and moist by a covering of oiled silk or cloth.

BREAD POULTICES

are best made by cutting slices half round a loaf, about three-quarters of an inch thick, placing them in a soup plate, and pouring boiling water upon them until they are quite soaked through. Smear a little sweet oil over the surface which is to go next the skin, and do not break the bread. Never apply a poultice to the skin hotter than the patient can bear with comfort. The old nurses' plan of burning the skin with them is simply needless torture.

BLISTERS AND COUNTER-IRRITANTS.

Blisters applied to a person in a state of great exhaustion should always be placed upon fleshy parts, except behind the ears; but never upon the windpipes of children, the breasts of women, nor too near the genital organs. Remove a blister so soon as the smallest signs of blistering appear, generally in from six to eight hours; and apply a bread poultice to draw. Clip any blisters that may then have

arisen, but do not tear off the loose skin, unless it is desired to dress the raw surface with some stimulating ointment.

Strangury, which sometimes follows the application of a blister, will be avoided by placing a bit of oiled tissue paper between the blister plaster and the skin, and by giving large quantities of thin gruel or barley water to drink; or by using a starch enema, with a few drops, 12 to 20, of laudanum.

TO ADMINISTER COD-LIVER OIL AND OTHER NAUSEOUS MEDICINES.

Pour the oil carefully into the middle of about one-third of a wine-glassful of cold water, milk, or orange wine. Throw it into the back of the mouth, holding the nose with one hand without drawing breath. A bit of dried bitter orange peel chewed both before and after taking the medicine is the best thing to remove the nauseous taste.

TO TEST THE QUALITY OF MILK, ARROWROOT, BUTTER, EGGS, &C.

MILK.—Put some milk into a tall narrow glass or test tube. Take a strip of paper the length of the bowl of the glass, and divide it, by means of compasses, into 100 equal parts. Mark these with ink, and gum the paper to the glass. Let the milk stand in the glass for 24 hours. The cream should reach down to the 8th, or, if very good, to the 11th mark. The milk of Alderney cows will often give from 30 to 40-100ths of cream. There should be no deposit at the bottom of the glass; if there be, chalk, flour, sulphate of lime, or other substance, has been added to thicken the milk. It should be uniform, and of a full opaque white colour, and free from bad smell. The specific gravity of good milk is from 1026 to 1035. The average of unskimmed milk may be taken at 1030 (Parkes). The addition of water will lower the specific gravity. One-fourth water will give a specific gravity of 1024; one-half, of 1015.

Keeping Milk.—If milk be a little sour, add a few grains of carbonate of soda, or a table-spoonful of lime water, to *such* a quantity as will be taken at once. By boiling milk

and putting it into bottles, quite filled, corked, and well sealed, the milk will keep for months.

BUTTER.—Never give a patient butter which has become rancid. It will be sure to cause diarrhœa, or some other disturbance of the digestive organs.

The taste and smell will determine the quality of the butter pretty nearly. Melt a small portion in a test tube, and look at it by a good light. Any inequality in composition will now be apparent. When again coagulated the taste will discover if mutton fat be present (Parkes).

EGGS.—Look through the eggs by means of good daylight. Fresh eggs are most transparent in the middle; stale ones at the top. Good eggs sink in a solution of one ounce of salt to ten ounces of water; inferior, swim. Totally bad eggs will float in pure water.

To keep eggs, boil them for half a minute to destroy their vitality. This will keep them for some time. They may be packed close in sawdust, salt, or lime, and kept dry and excluded from the light. Perhaps salt is the best.

ARROWROOT.—Good arrowroot is quite white; has a gritty or starchy feel; and the jelly made from it should be firm, transparent, colourless, and of good taste. If potato-starch have been mixed with the arrowroot, a larger quantity will be required to make a firm jelly.

TABLE OF FREEZING MIXTURES APPLICABLE TO THE PRODUCTION OF COLD, TO BE APPLIED TO THE HEAD IN FEVERS, ETC.

With Snow or Ice.

	By weight	Resulting temperature.
Muriate of soda	1 part	−5 F., or 37° below freezing.
Snow	2 parts	
Muriate of soda	2 parts	−12 F., or 44° below freezing.
Muriate of ammonia	1 part	
Snow	5 parts	
Muriate of soda	5 parts	−25 F., or 57° below freezing.
Nitrate of ammonia	5 „	
Snow	12 „	

Without Snow.

	By weight	
Muriate of ammonia	5 parts	temperature falls from 50° to 10°.
Nitrate of potash	5 „	
Water	16 „	
Nitrate of ammonia	1 part	temperature falls from 50° to 4°.
Water	1 „	

There are other mixtures which reduce the temperature very much below this, but they require strong caustic acids, which it would be unsafe to use in the sick room. Unless great cold be required, the mixtures given above need not be placed upon the patient's head, but used to surround a jug of water, in which cloths can be dipped from time to time.

DISINFECTANTS.

The best disinfectant for the sick room is the PERMANGANATE OF POTASH, known as CONDY'S DISINFECTING FLUID. It may be safely used on floors, &c., and produces no disagreeable odour. Pour a small quantity (two or three table-spoonfuls) into night chairs or chamber utensils, and place some in saucers about the room. If any offensive smell arise from water-closets, pour some down as often as the odour is perceived.

The CHLORIDES OF LIME AND SODA are more powerful disinfectants, but they have this disadvantage, that when used in large quantity in the sick room, the fumes are apt to irritate the lungs of the occupants, and the smell is also disagreeable. To disinfect rooms when no one is in them, also clothing, closets, &c., they answer the purpose better than the Condy's fluid.

The cheapest way is to place a quarter of a pound of the dry chloride of lime in a soup plate and to pour upon it half a pint of water, to which add, by slow degrees, two ounces of strong nitrous acid (aquafortis). Clothing hung upon a rail near to the mixture will imbibe the fumes and be entirely purified from infectious matter.

When chloride of lime is used in the same room with the patient, it should be in solution. Pour three or four

ounces into saucers, and place in two or three places in the room, and on the landing; or water may be poured upon the dry powder in earthen vessels.

LIME, CHARCOAL, or any charred earth, are also good disinfectants. Charcoal is the best, and should always be placed in every apartment which is inhabited by a patient labouring under fever, or other disease in which morbid emanations are being thrown off from the system. It should be in small pieces (or finely powdered, if vegetable charcoal be used), and placed in bags or saucers near the patient. It need not be often removed. Quicklime will purify a room of the damp musty smell which it acquires after having been long shut up. It is also useful for throwing down water-closets, and into cesspools, &c.

HEAT is a powerful disinfectant, and with respect to clothing, bedding, &c., is by far the best that can be used. A heat of 212°—that of boiling water—destroys the infection of most, if not of all diseases. Linen and cotton materials may have boiling water poured upon them with which some of the solution of chloride of lime has been mixed. Woollen clothing must be subjected to a dry heat of 160°, better of 212°, for several hours. This may be done by putting them into an oven, as soon as the bread is withdrawn; or one heated on purpose. No injury is sustained by the wool, although colours are not improved by the process.

In cases of pestilential disease, such as typhus fever, cholera, scarlet fever, plague, &c., the rooms in which patients have been confined, or have died, should be purified by means of nitrous acid gas. This may be cheaply done by placing some common saltpetre in a soup plate, adding water enough to dissolve it, and then pouring slowly upon it a small quantity of oil of vitriol. No one should be in the room whilst this process is going on. Free washing and ventilation afterwards will supersede all necessity for scraping the ceilings and repapering the walls, to which some persons have recourse. If used in fever rooms or wards, whilst the patients are present, the fumes must be slowly evolved in small quantities only.

In slight cases of illness, free ventilation of the apartment will be a sufficient disinfectant. But it must be borne in mind that the old nurses' favourite fumigations by means of burning brown paper, vinegar, pastiles, &c., are quite useless in purifying the air; and by rendering the atmosphere of the room more pleasant, prove actually dangerous by withdrawing attention from really efficient disinfectants.

A FEW DOMESTIC REMEDIES FOR EMERGENCIES.

The dose of sal volatile for fainting, heartburn, &c., is one tea-spoonful in a little cold water. It may be repeated once or twice after a short interval.

An EMETIC may consist of twenty grains of sulphate of zinc, dissolved in a glass of cold water; or of half an ounce of ipecacuanha wine, or half an ounce of antimonial wine—for an adult. For children, warm water; or one tea-spoonful of ipecacuanha wine every five minutes until vomiting be produced. When a poison has been swallowed, such as the berries of the deadly nightshade, the seeds of the laburnum, and other vegetable substances, or opium, mix a table-spoonful of flour of mustard in a tumbler of warm water, and cause it to be swallowed whilst you send for medical aid.

APERIENTS.—The safest aperient, when out of the reach of medical advice, is castor oil. Give a full quantity—an ounce to an adult, half an ounce to a child over five years of age. Senna tea is also a good aperient for children. Avoid dosing them with calomel, grey powder, ipecacuanha, and such drugs, without advice. If the stomach of a child be much overloaded, the tongue foul, with a hot dry skin, give an emetic first, and after it three grains of calomel with five to ten of rhubarb, according to age.

In DIARRHŒA caused by errors of diet, give first a gentle aperient, aided, if requisite, by an enema of warm water. A warm bath, and hot bottle to the feet. If not subdued, then give the following:—

Take of Compound chalk powder	1 drachm
Aromatic confection, in powder	1 „
Tincture of opium	40 drops
„ henbane	2 drachms
Water or peppermint water	8 ounces

Mix, and give two table-spoonsful every two or three hours until the pain and diarrhœa have ceased.

To infants give the following:—

Compound chalk powder	1 drachm
Syrup of white poppies	2 drachms
Water	2 ounces

Dose, one tea-spoonful every two or three hours for a child under three years; two tea-spoonsful, or a dessert-spoonful, to one from three to ten.

FOR FLATULENT DISTENTION OF THE STOMACH IN INFANTS AND CHILDREN.

Take of Powdered rhubarb	2 scruples
Carbonate of soda	1 drachm
Tincture of ginger	1 „
„ gentian	2 drachms
Water, or dill water	6 ounces

A small dessert-spoonful occasionally, or an hour after food.

FOR ACIDITY, PAIN, AND DISTENTION, AFTER FOOD, IN ADULTS.

Take of Lime water	1 ounce
Peppermint water	½ „
Sal volatile	1 tea-spoonful

Mix for a dose when the symptoms are present.

If lime water be not at hand, replace it by as much carbonate of soda as will lie upon a fourpenny-piece.

Every mother should possess a graduated medicine glass, and a box of apothecaries' scales and weights.

ANOTHER FORM.

One or two table-spoonsful of fluid magnesia, with an equal quantity of peppermint water; this may be repeated until it acts upon the bowels.

FOR A FEVERISH COLD, AND AT THE COMMENCEMENT OF ERUPTIVE FEVERS, MEASLES, SCARLATINA, ETC.

Take of Nitrate of potash (saltpetre) . . .	10 grains
Paregoric	1 drachm
Ipecacuanha, in powder	1 grain
Camphor water	1 ounce

Mix. Take at bed-time, with a basin of hot white wine whey, and solicit perspiration by means of warmth. May be safely repeated every three or four hours, until the arrival of medical aid. Half the dose for a child under ten.

DOSES OF MEDICINES FOR VARIOUS AGES.

	Dose as		Dose as
For an adult . . .	1	Not exceeding 3 years .	$\frac{1}{8}$
Not exceeding 14 years .	$\frac{1}{2}$	„ „ 1 year .	$\frac{1}{10}$
„ 7 „ .	$\frac{1}{3}$	„ „ 6 months .	$\frac{1}{20}$
„ 5 „ .	$\frac{1}{4}$	„ „ 3 „ .	$\frac{1}{30}$.

ARTIFICIAL WOMAN'S MILK FOR DRY NURSING.

Take of good cow's milk	4 ounces
„ Water	3 ounces
„ Cream	1 ounce
„ Sugar (sugar of milk, if procurable) .	$\frac{1}{4}$ ounce

Mix. If there be any acidity, add a few drops of clear lime water. (Bödeker.)

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